CATALOGUE #07 CAT/403 1 2

Vickers®

Pressure Relief

EATON

Pressure Relief Valves

Remote Controls, Relief and Sequence Valves, and Single and Multiple Pressure Solenoid and Air Operated Relief Valves

VICKERS

5110.00/EN/1297/A

Introduction

Remote Controls

Small, easily installed remote pressure control valves make it possible to control a balanced piston pressure relief valve from a more convenient location.

Relief and Sequence Valves

Pressure relief valves mount between the pump and valve system to protect against overloads. A suitable pilot valve may be used to "vent" the balanced piston relief valve when the system does not require power. This venting unloads the pump through the relief valve at low pressure, avoiding energy waste and reducing operating costs.

A sensitive adjustment mechanism allows the setting of the pressure in fine increments over a wide range — up to the maximum rating of the valve.

Stepped relief valves at the control console or other remote location, and elimination of separately mounted hydraulic remote controls and related connecting piping, result in lower installed cost. The valves are available with SAE straight threads, NPT threads, or interfaces for manifold or subplate mounting to provide no-leak connections.

Single and Multiple Pressure Solenoid and Air Operated Valves

These balanced piston type valves are used in applications needing an electrically or pneumatically controlled adjustable pressure relief or regulating valve to limit the pressure in a hydraulic circuit to the desired maximum.

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Application Data 61

Series Model CGE-02/06/10
Remote/Electrically Modulated Controls

Model Code

CGE - 02 - 1 (V) - 2*

[1] [2] [3] [4] [5]

[1] Model Series

CGE - Relief valve, manifold or subplate mounted, remote electrically modulated

[2] Valve Size

02 - NFPA-DO3 (ISO-4401-03) interface
06 - 60 series (3/4" nominal size)
10 - 100 series (1-1/4" nominal size)

[3] Pressure Rating

1 - 70 bar (1000 psi)
3 - 210 bar (3000 psi)

[4] High Vent Spring

(For CGE-06 & -10 3000 psi pressure models only). Omit if not required.

[5] Design Number

Subject to change. Installation dimensions remain as shown for design numbers 20 through 29

General Information

The CGE-02 valve provides the capability to modulate system pressure when connected to a relief or reducing valve or regulating the pressure setting of a pressure compensator variable displacement pump.

The CGE-06/10 provides the capability to modulate system pressure using a remote electrical controller. The pressure setting of the valve is approximately proportional to input current; increasing current provides increasing pressure.

Manual Operation

A manual override adjustment of the CGE-06/10 operates over the full pressure range and should be set just above the maximum pressure to be controlled electrically. For example, the override should be set at 2200 psi when maximum electrically controlled pressure is 2000 psi.

The override adjustment can also be used for complete manual operation of the valve during set up and troubleshooting by isolating the pilot head section from the manual override section. This is done by removing an access plug and reversing a button in the pilot section (see fig. 1).

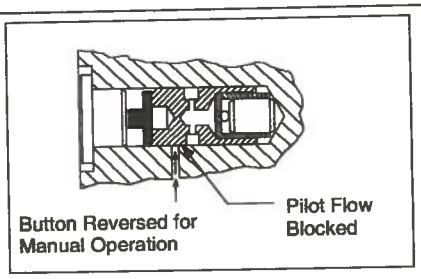


Figure 1

Electrical Power Supply

Vickers power supply EMCS-*-30 is recommended for controlling this valve. Figure 2 shows the basic diagram (amplifier switch should be in position 1).

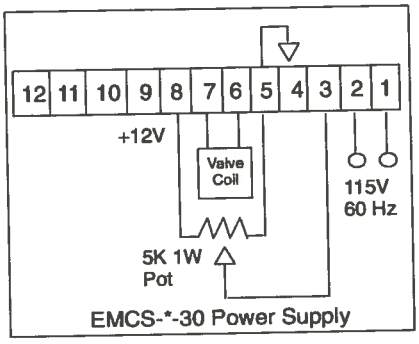


Figure 2

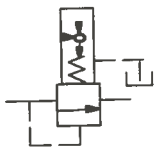
Tank Connection

The tank connection should be piped directly to tank through a surge free line to minimize back pressure. If tank line back pressure exceeds system pressure by 7 bar (100 psi) a malfunction may occur. Any pressure in the tank line is an additive when the valve is controlled by the manually adjusted (non-electrical) head.

Pilot Drain Connection

Drain line must be full size unrestricted and connected directly to reservoir so that it terminates below reservoir fluid level. No other lines are to be connected to this drain line. Pressure in this line (taken at the valve) not to exceed 1 bar (15 psi).

Graphical Symbol



Minimum Pressure Specifications (Zero Current)

Model	Flow		Minimum Pressure	
	L/min	USgpm	bar	PSI
CGE-06-1-2*	76	20	5.2	75
CGE-06-3*-2*			10.4	150
CGE-06-3V-2*			20.7	300
CGE-10-1-2*	189	50	5.2	75
CGE-10-3-2*			10.4	150
CGE-10-3V-2*			20.7	300

Series Model CGE Remote/Electrically Modulated Controls

Installation Data

Filter Screen

The CGE-02 valve contains a filter screen in the pressure port of the valve head (fig. 3) which may require periodic cleaning, depending on system cleanliness.

The CGE-06/10 valves contains a filter screen in the pressure port of the valve head (fig. 3) and an additional screen in the valve body (fig. 4). Both require periodic cleaning depending on system cleanliness.

WARNING

Before breaking a circuit connection, make certain that power is off and system pressure has been released. Lower all vertical cylinders, discharge accumulators and block any load whose movement could generate pressure. Plug all removed units and cap all lines to prevent the entry of dirt into the system.

To remove the filter screen from the valve head (fig. 3), first shut down the machine and remove the access plug, button, spool and screen. Clean screen and reassemble.

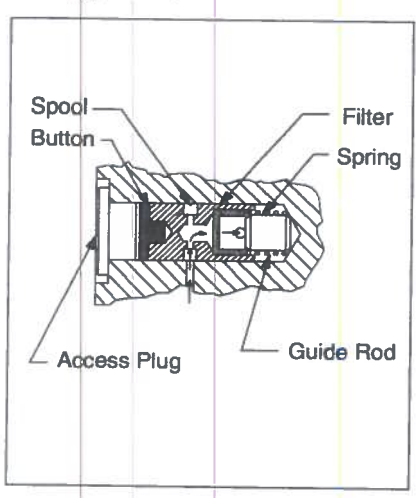


Figure 3

To remove the filter screen from the valve body (fig. 4), first shut down the machine and remove the relief valve from the pump. Remove the snap ring and screen. Clean screen and reassemble.

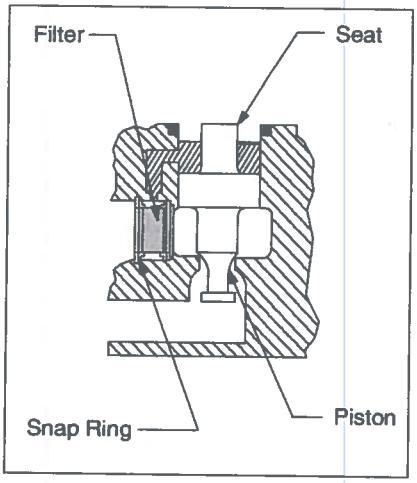


Figure 4

Ratings

The CGE Series are rated for a maximum pressure of 210 bar (3000 psi). The table on page 3 lists minimum pressures attainable when the CGE is used with three sizes of system relief valves at various system flows.

Pressure and Flow (see tables on right)
Pressure change due to temperature:
The maximum pressure deviation between 26.7°C (80°F) and 65.6°C (150°F) is 4.8 bar (70 psi).
Hysteresis:
5% of maximum current (without dither-see curves on pages 5–7)
3% of maximum current (with dither)
Recommended dither:
10 mA (RMS) at 60 Hz
Power required (maximum): 5.75 watts
Nominal coil resistance: 18 ohms
Current required:
0-500 mA DC (not polarity sensitive)

Response Time

For response time, see tables below. Note that response time will increase with increasing flows. Also response time is dependent on the amount of all volume in the pressure side of the circuit; less oil volume under pressure will result in faster response times.

Step input currents of less magnitude will decrease response time proportionally. Decreasing pressure response will be approximately 1/4 of response time values.

Note

Response times shown are typical of those experienced with an average volume of oil under compression. For small volumes of oil under compression (20-40 cubic inches), response times are 60-80 ohms.

Pressure & Flow Ratings

Model	Maximum Pressure bar (psi)	Maximum Flow L/min (USgpm)
CGE-02-1	70 (1000)	1.9 (0.5)
CGE-02-3	210 (3000)	
CGE-06-1-2*	70 (1000)	170 (45)
CGE-06-3*-2*	210 (3000)	
CGE-10-1-2*	70 (1000)	380 (100)
CGE-10-3*-2*	210 (3000)	

Minimum Controllable Flows

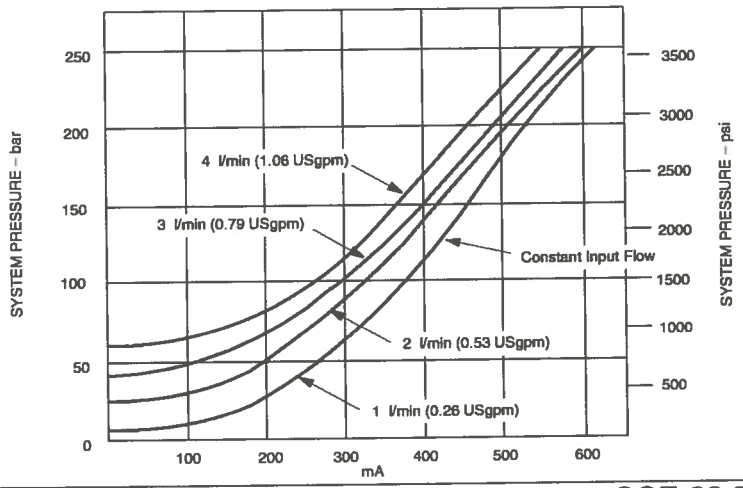
Model	L/min	USgpm
CGE-06-*-2	7.6	2
CGE-10-*-2	11.4	3

Response Time, typical

Model	Step input mA	Flow		Pressure Increase		Response Time-ms
		L/min	USgpm	bar	PSI	
CGE-06-1-2*	0-500	76	20	5-70	75-1000	250
CGE-06-3*-2*				10-210	150-3000	290
CGE-10-1-2*		189	50	5-70	75-1000	400
CGE-10-3*-2*				10-210	150-3000	240

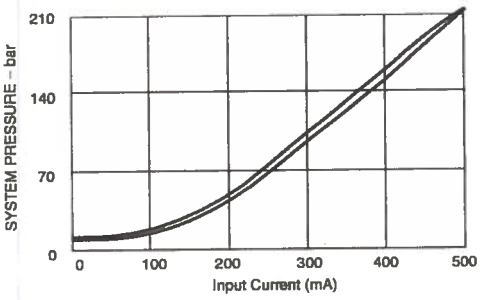
Performance Curves

CGE-02-3-20

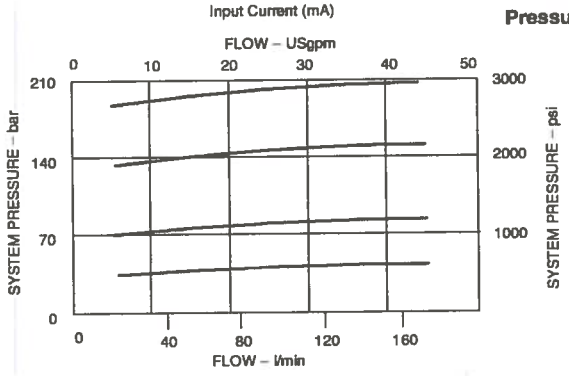


CGE-06-3-2*

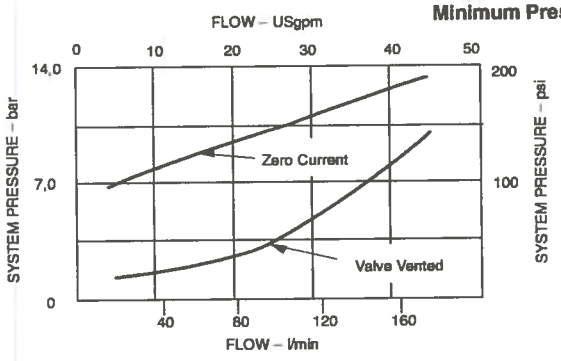
Flow – 76 L/min (20 USgpm)
Pressure vs Current



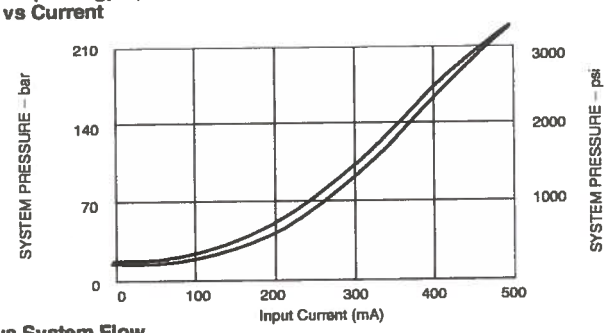
Pressure vs System Flow

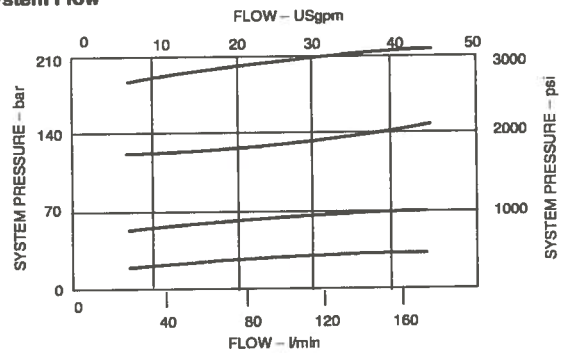


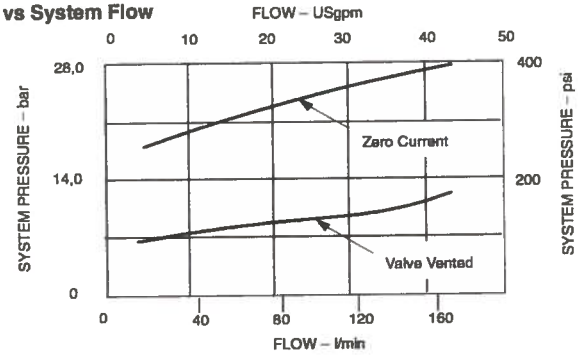
Minimum Pressure vs System Flow



CGE-06-3V-2*





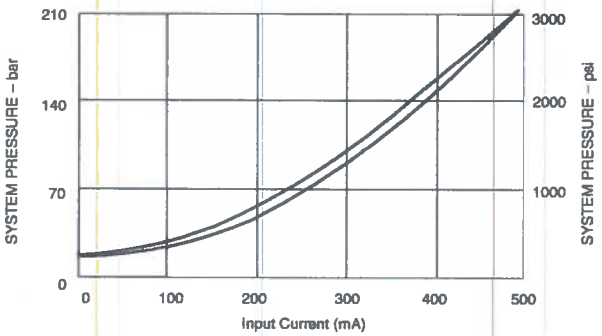


Performance Curves

CGE-06-1-2*

Pressure vs Current

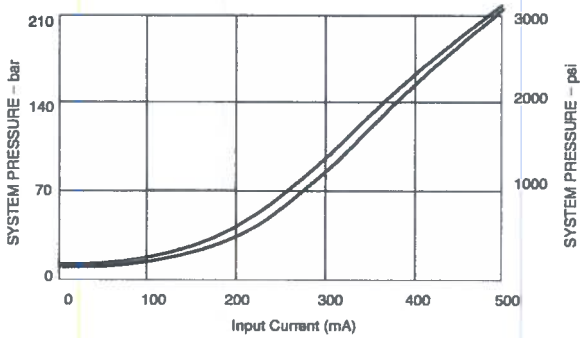
Flow – 76 L/min (20 USgpm)



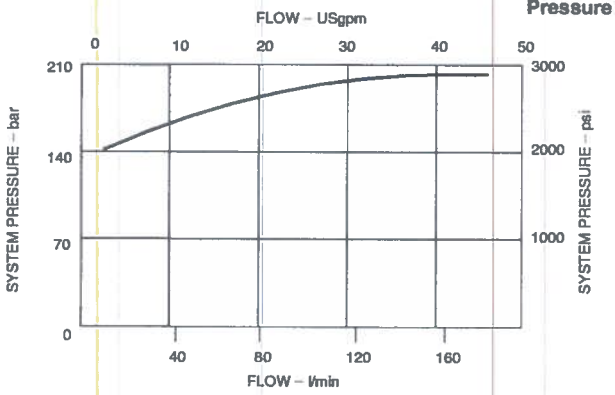
CGE-10-3-2*

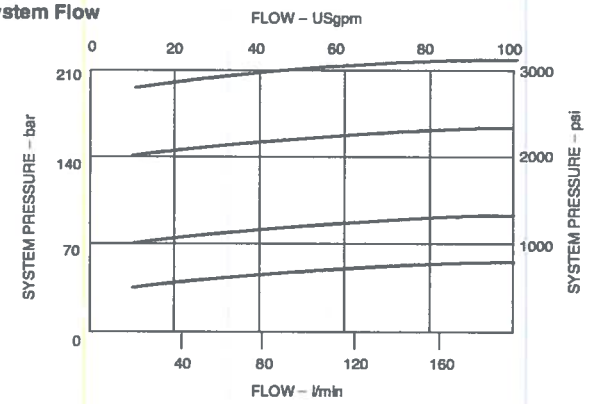
Pressure vs Current

Flow – 189 L/min (50 USgpm)

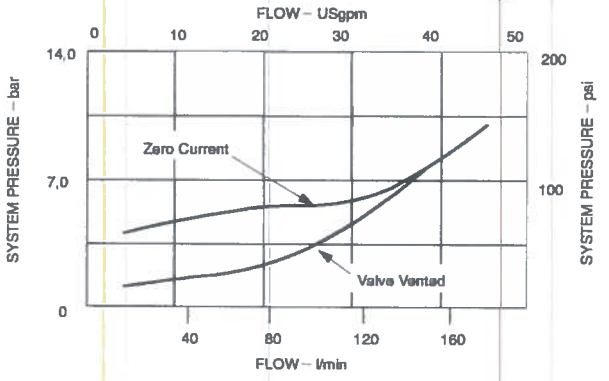


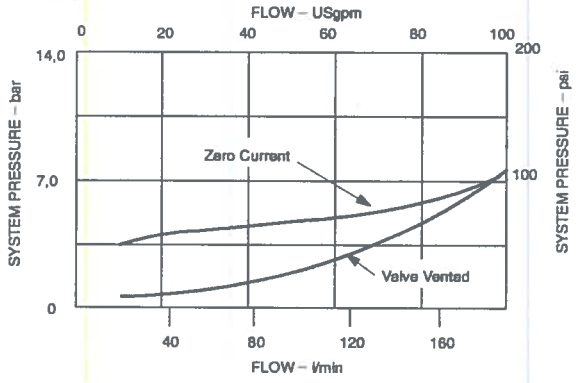
Pressure vs System Flow





Minimum Pressure vs System Flow

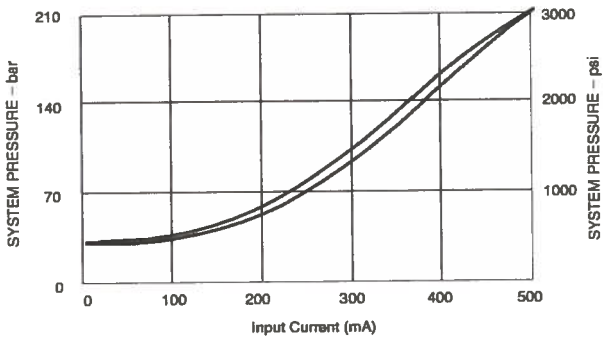


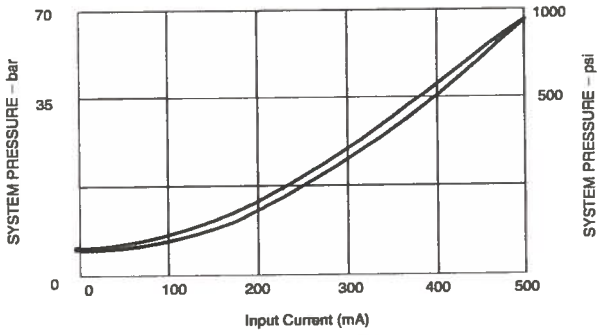


CGE-10-3V-2*

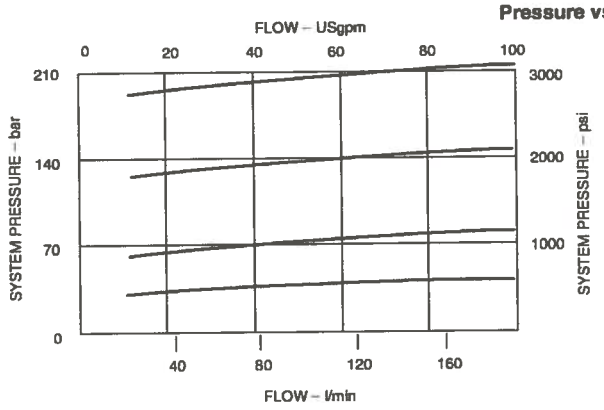
CGE-10-1-2*

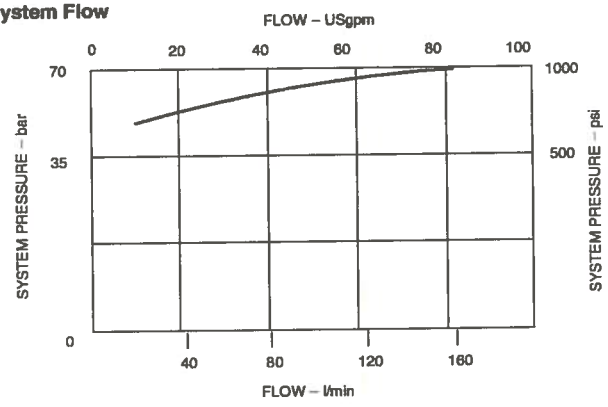
Flow – 189 L/min (50 USgpm)
Pressure vs Current



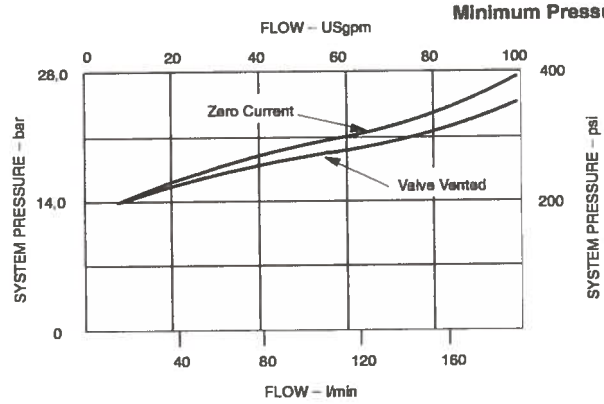


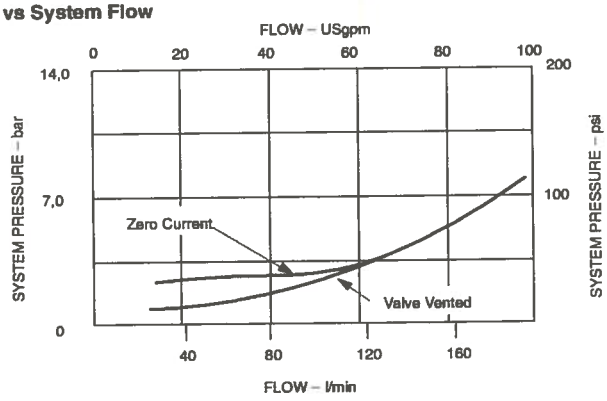
Pressure vs System Flow





Minimum Pressure vs System Flow



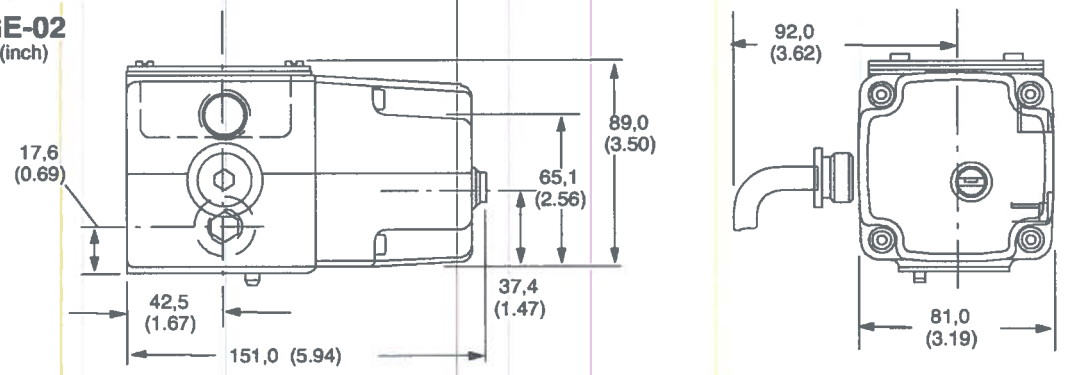


Series Model CGE Remote/Electrically Modulated Controls

Installation Dimensions

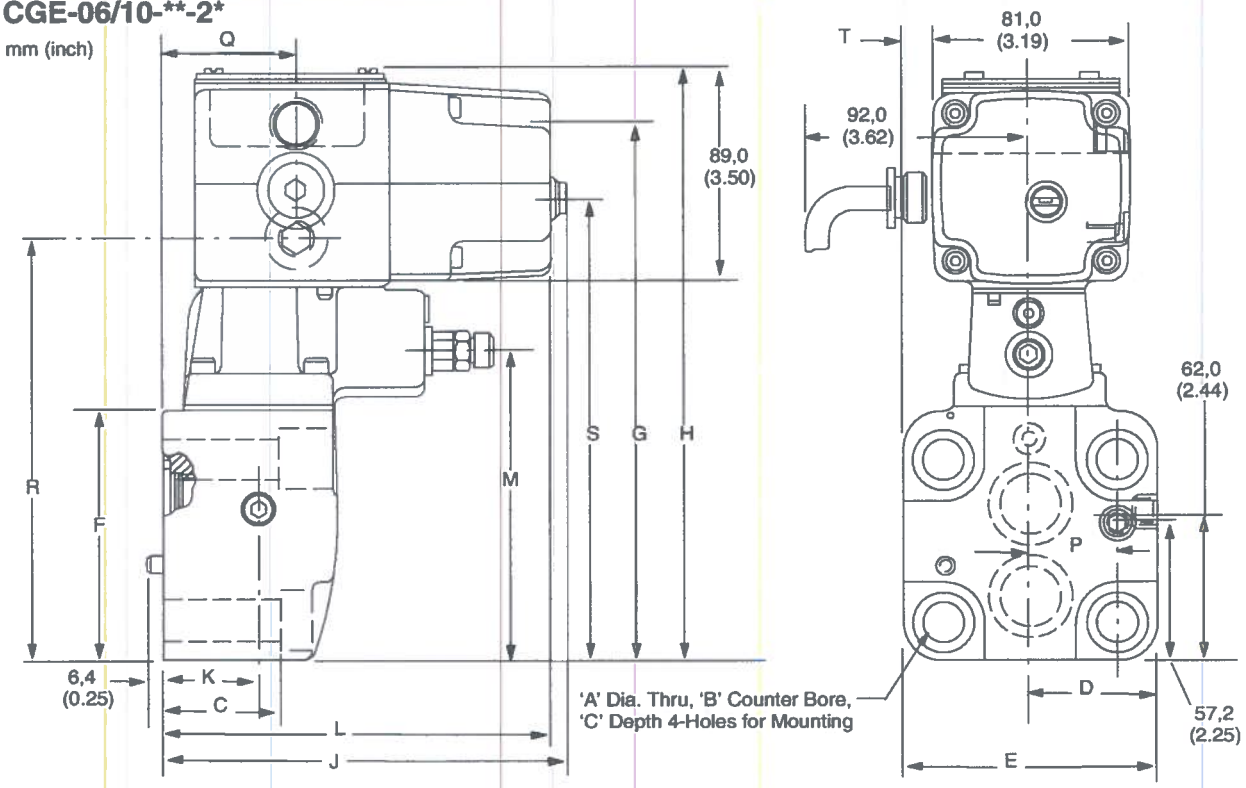
CGE-02

mm (inch)



CGE-06/10-**-2*

mm (inch)



Model	A	B	C	D	E	F	G	H	J	K	L	M	N
CGE-06	16,6 (0.65)	24,6 (0.96)	47,8 (1.88)	53,4 (2.10)	106,4 (4.19)	103,1 (4.06)	220,5 (8.68)	244,4 (9.62)	165,0 (6.50)	38,9 (1.53)	158,6 (6.25)	127,0 (5.00)	71,4 (2.81)
CGE-10	19,8 (0.78)	29,3 (1.15)	63,5 (2.50)	66,8 (2.63)	133,4 (5.25)	109,5 (4.31)	231,7 (9.12)	255,5 (10.06)	170,5 (6.71)	42,9 (1.69)	164,1 (6.46)	138,2 (5.44)	85,9 (3.38)

P	Q	R	S	T	Weight	
					kg	lbs.
35,1 (1.38)	54,1 (2.13)	173,0 (6.81)	192,8 (7.59)	13,3 (0.53)	10	22
46,0 (1.81)	59,6 (2.35)	184,2 (7.25)	204,2 (8.04)	26,9 (1.06)	13	29

Series CGR-02 Remote Controls

Model Code

(F3) - CGR - 02 - C - (K) - 30

1 2 3 4 5 6

1 Seals

F3 – For mineral oil and fire resistant fluids
Blank – Omit if not required

2 Model Series

C – Relief valve
G – Subplate mounted
R – Remote control

3 Valve Size

02 – 6,35 mm ($^1/_4$ in) nominal size

4 Maximum Adjustable Pressure

B – 70 bar (1000 psi)
C – 140 bar (2000 psi)
F – 210 bar (3000 psi)

5 Adjusting Knob

K – Optional adjusting knob installed
Blank – Omit if not required

6 Design Number

Subject to change. Installation dimensions same for designs 30 through 39.

General Information

Typical application is as a remote control device for balanced piston type relief valves. The CGR-02 is not intended for use as a relief valve by itself. The valve is normally used to provide adjustment of system pressure from a convenient or remote location.

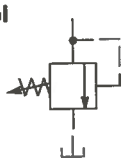
Pressure Range

The available pressure ranges for this valve are from 4,5 to 70 bar (65 to 1000 psi), from 4,5 to 140 bar (65 to 2000 psi), and from 4,5 to 210 bar (65 to 3000 psi). Therefore, the main system relief valve being controlled by the CGR-02 should be selected according to the maximum pressure required in the system. Check the model code for the main system relief valve.

Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw or optional adjustment knob. Turning clockwise increases pressure, and turning counterclockwise decreases pressure. The maximum pressure that can be attained by turning the adjusting screw is set at the factory to the value specified in the model code.

Graphical Symbol



Ratings

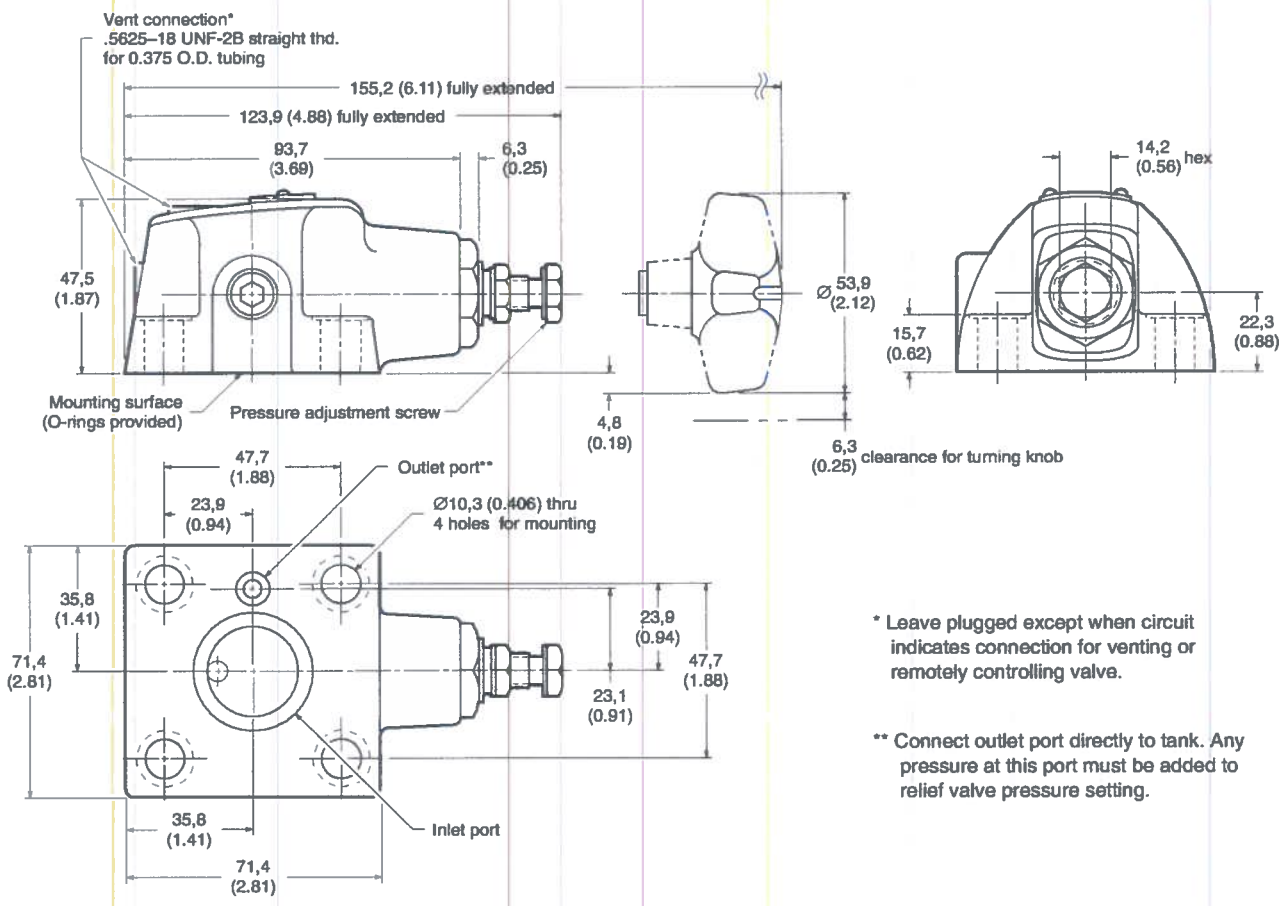
The CGR-02 is rated for a maximum pressure of 210 bar (3000 psi). The following table lists minimum pressures attainable when the CGR-02 is used with five sizes of system relief valves at various system flows.

	Flow l/min (USgpm) Through Main System Relief Valve								
	19 (5)	38 (10)	78 (20)	170 (45)	284 (75)	379 (100)	568 (150)	758 (200)	947 (250)
Model	Minimum Pressure bar (psi)								
CS*-03-*-50	4,7 (68)	5,0 (73)	5,9 (86)	9,5 (138)	—	—	—	—	—
CS*-03-*V-50	7,4 (108)	8,4 (122)	10,0 (145)	12,8 (186)	—	—	—	—	—
C**-06-*-50	4,7 (68)	5,0 (73)	5,9 (86)	9,5 (138)	—	—	—	—	—
C**-06-*V-50	7,4 (108)	8,4 (122)	10,0 (145)	12,8 (186)	—	—	—	—	—
C**-10-*-30	—	4,8 (69)	4,9 (71)	5,5 (80)	7,6 (110)	12,0 (174)	—	—	—
C**-10-*B-30	—	10,1 (146)	10,7 (155)	11,9 (172)	12,6 (182)	13,5 (196)	—	—	—
CF-16-*-10	—	3,6 (52)	3,9 (56)	4,3 (62)	4,6 (66)	4,7 (68)	4,8 (70)	—	—
CF-16-*V-10	—	13,2 (192)	14,1 (204)	15,5 (225)	16,8 (244)	17,1 (248)	17,6 (255)	—	—
CF-24-*-10	—	—	—	15,5 (225)	18,6 (270)	22,1 (320)	31,0 (450)	40,7 (590)	48,3 (700)
CF-24-*V-10	—	—	—	51,7 (750)	56,6 (820)	59,3 (860)	61,4 (890)	62,4 (905)	63,1 (915)

Series CGR-02 Remote Controls

Installation Dimensions

mm (inch)



* Leave plugged except when circuit indicates connection for venting or remotely controlling valve.

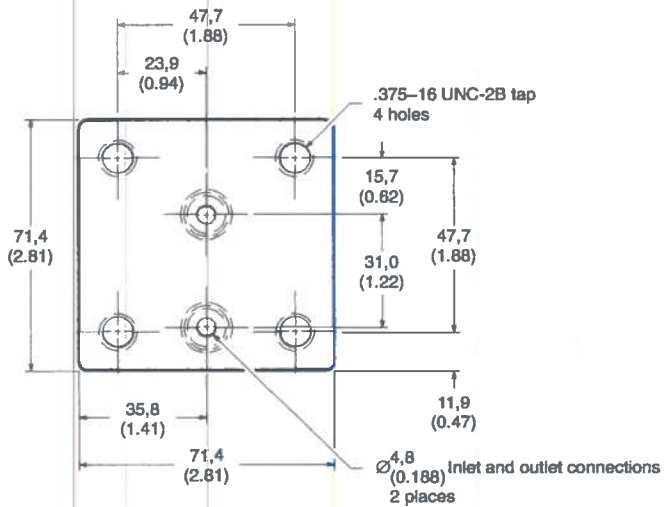
** Connect outlet port directly to tank. Any pressure at this port must be added to relief valve pressure setting.

Mounting Pad

mm (inch)

The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch).

Mounting bolt torque ($^3/_8$–16 screws) is 3,4 Nm (30 lb. ft..). Mounting bolts should be SAE grade 7 or better.



Series C-175 Remote Control/Relief Valves

Model Code

C - 175 - C - 20

1 2 3 4

1 Model Series

C – Relief valve

2 Size

175 – 44,45 mm (1.75 in) diameter body

3 Pressure Range

B – 5 to 70 bar (75 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)

4 Design Number

Subject to change. Installation dimensions same for designs 20 through 29.

General Information

The C-175 is suitable for applications requiring an adjustable, small capacity, direct action, spring-loaded type pressure relief valve or pressure regulating valve. It can also be applied as a remote control valve for pilot operation of balanced piston type relief valves. The C-175 is designed to be panel mounted.

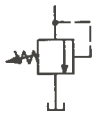
Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning the pressure adjustment knob. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Ratings

The C-175 remote control for relief valves is rated for a maximum pressure of 210 bar (3000 psi) and a maximum flow capacity of 11,3 l/min (3 USgpm).

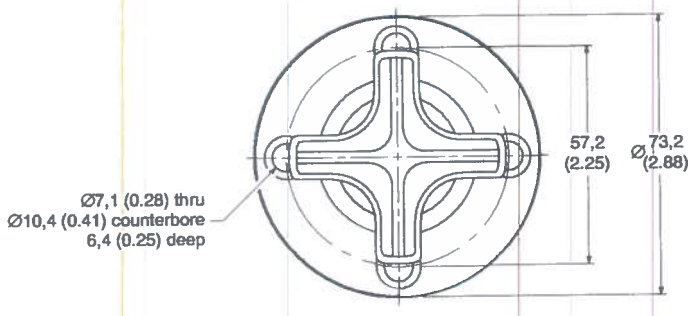
Graphical Symbol

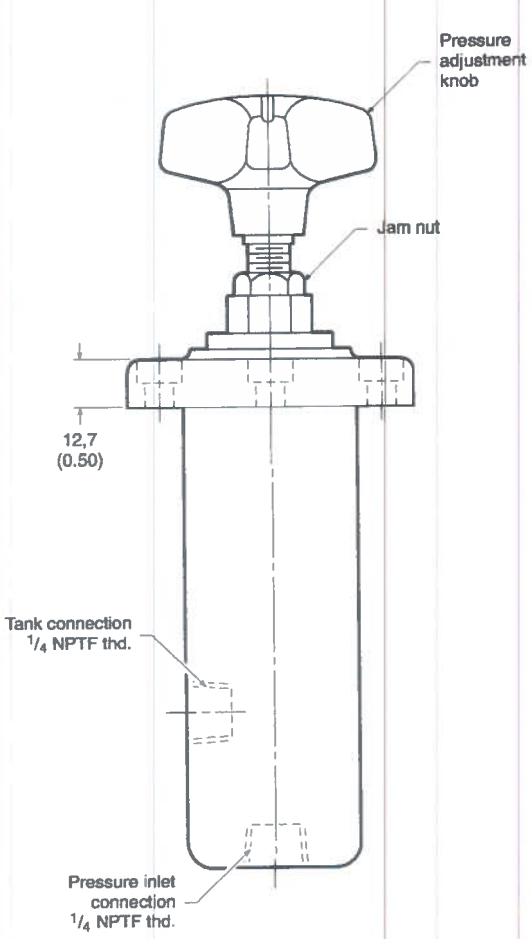


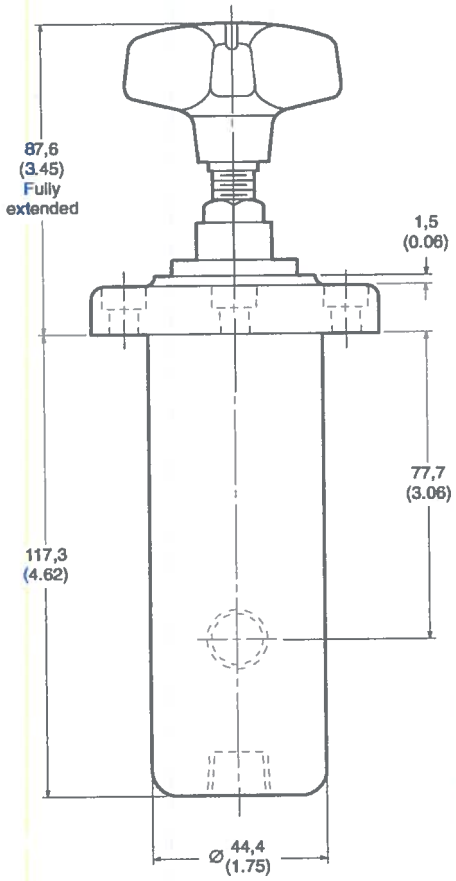
Series C-175 Remote Control/Relief Valves

Installation Dimensions

mm (inch)







Series CG-03 Relief Valves

Model Code

(F3) - CG - 03 - C (V) - 10 - (S81)

1 2 3 4 5 6 7

1 Seals

F3 – For mineral oil and fire resistant fluids
Blank – Omit if not required

2 Model Series

C – Relief valve
G – Subplate mounted

3 Valve Size

03 – 9,525 mm ($^3/_8$ in) nominal size

4 Pressure Range

B – 5 to 70 bar (75 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)

5 High Vent Spring

V – Optional high vent spring installed
Blank – Omit if not required

6 Design Number

Subject to change. Installation dimensions same for designs 10 through 19.

7 Special Feature Suffix

S81 – Optional handwheel control installed

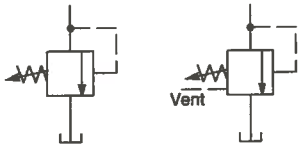
General Information

Series CG-03 valves utilize balanced piston type construction. They are designed for applications requiring an adjustable pressure relief valve to limit system pressure to a desired maximum.

Pressure Adjustment

Pressure is adjusted by loosening a jam nut and turning an adjustment screw or optional handwheel. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Graphical Symbols



Pressure Range

The available pressure ranges for this valve are from 5 to 70 bar (75 to 1000 psi), from 35 to 140 bar (500 to 2000 psi), and from 100 to 210 bar (1500 to 3000 psi). Select an appropriate pressure range that will prevent excessively high working pressures from being imposed on the pump and other equipment.

Tank Connection

If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur. Pressure in the tank line is additive to the pressure setting. Contact your Vickers representative for alternatives.

Ratings

The CG-03 is rated for a maximum pressure of 210 bar (3000 psi). Rated capacity is 0 to 30 l/min (0 to 8 USgpm). The following table lists approximate minimum venting pressures for the three available pressure ranges of the CG-03 with and without high vent springs.

Model	Pressure Range bar (psi)	Percentage of Maximum Rated Capacity			
		25%	50%	75%	100%
		Minimum Venting Pressure bar (psi)			
CG-03-B-10	5 to 70 (75 to 1000)	25	27	28	32
CG-03-BV-10		74	75	78	81
CG-03-C-10	35 to 140 (500 to 2000)	25	27	28	32
CG-03-CV-10		74	75	78	81
CG-03-F-10	100 to 210 (1500 to 3000)	25	27	28	32
CG-03-FV-10		74	75	78	81

Series CG-03 Relief Valves

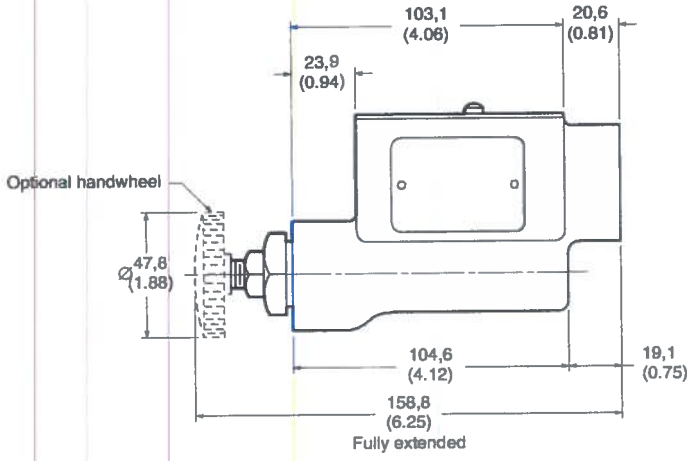
Installation Dimensions

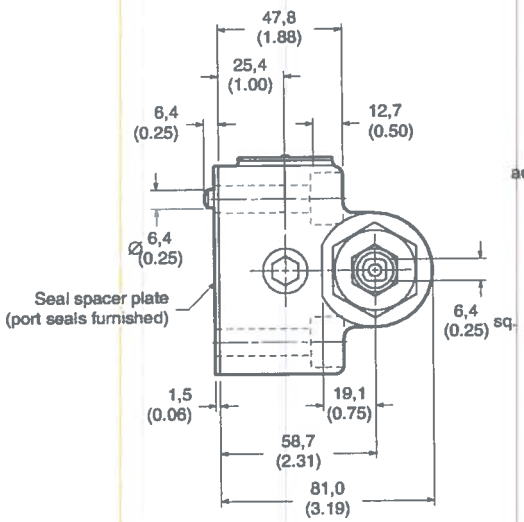
mm (inch)

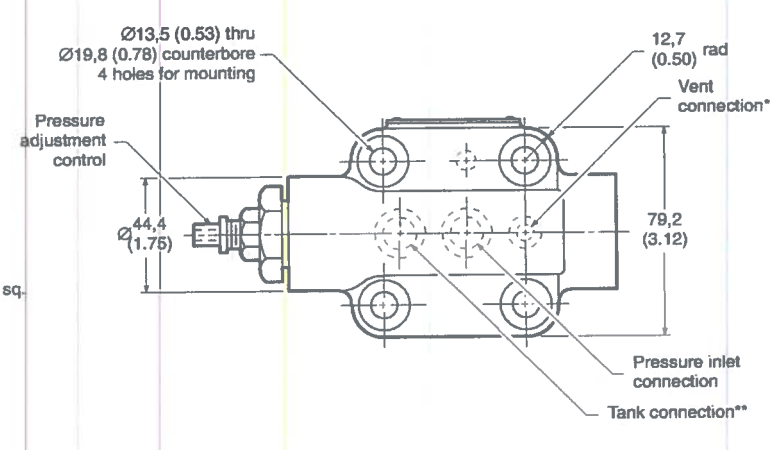
Note

* Use vent connection only when circuit indicates a connection for venting relief valve.

** Not to exceed 7 bar (100 psi).







Mounting Subplates

mm (inch)

When a subplate is not used, a machined pad (shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch).

If mounting bolts are provided by the customer, they should be SAE grade 7 or better.

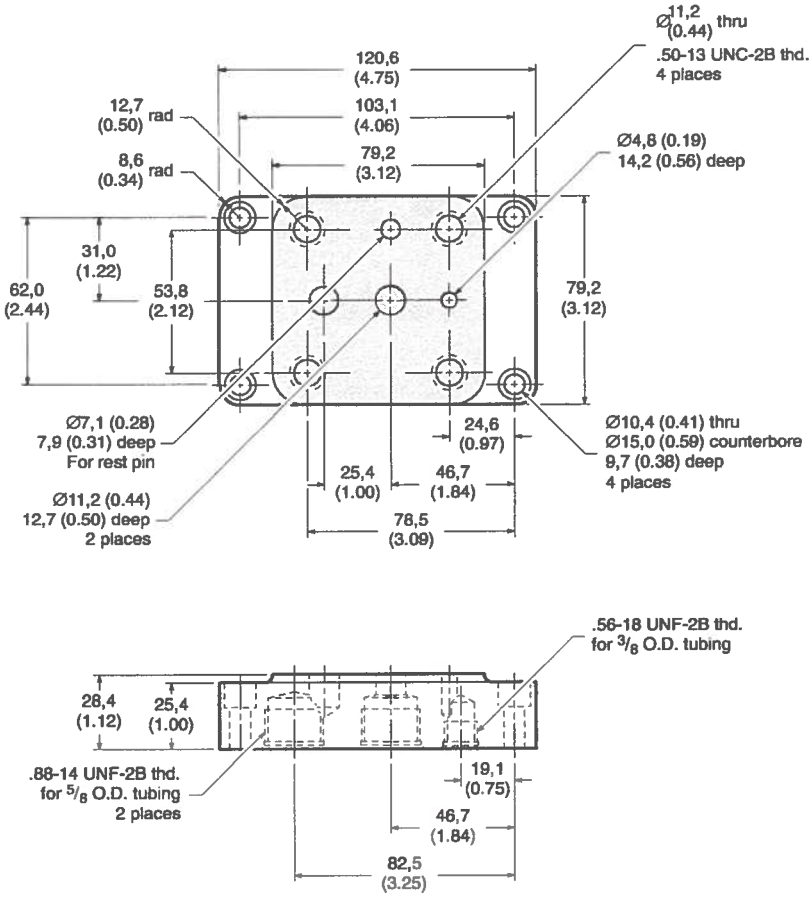
Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG-03-B-10 valve
(1) CGM-10S-03-10 subplate
(1) BKCG03602 bolt kit (assembly number 255602, consisting of four bolts, $^1/_2$-13 x 2.00")

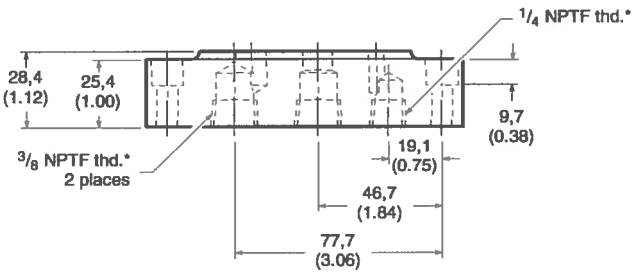
CGM-10S-03-10

(Straight thread connections)



CGMT-03-10

(Pipe thread connections.* All other dimensions same as CGM-10S-03-10.)



*Not recommended

Series C*-03/06/10 Relief/Sequence Valves

Model Code

C S - (H) 06 - C (V) (Y) - 50

1 2 3 4 5 6 7 8

1 Valve Type

C – Relief valve

2 Connections

S – SAE straight thread
T – NPTF thread* (not available in 03 size valve)

*Not recommended

3 High-flow Designation

H – High-flow valve (available in CS models only)
Blank – Omit if not required

4 Valve Size

03 – .8750-14 UNF-2B straight thread (0.625 tubing)
06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or 3/4" pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or 1 1/4" pipe

5 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)

6 High Vent Spring

V – Optional high vent spring installed (required in high-flow models)
Blank – Omit if not required

7 Sequence Valve Designation

Y – Configured as sequence valve (not available in 03 size valve)
Blank – Omit for relief valve

8 Design Number

5* – For 03 and 06 size valves
3* – For 10 size valve

Subject to change. Installation dimensions same for designs 30 through 39 and for designs 50 through 59.

General Information

The series C*-03/06/10 valve can be ordered as either a pressure relief valve or a sequence valve.

Inlet and outlet pressure connections can be used interchangeably when the valve is mounted in the pressure line. The valve may also be teed off the pressure line with one of the inlet pressure connections plugged.

Minimum venting pressure (see curves on page 18) designates the pressure at which the valve operates (regardless of adjustment) when the vent connection is open to tank. This action is sometimes required during a part of a cycle. Use only when indicated by circuit.

Relief Valve Configuration

The C*-03/06/10 is designed for use in applications requiring an adjustable pressure relief or regulating valve to limit the pressure in a hydraulic circuit to a desired maximum.

In addition to conventional relief valve operation, two other functional modes can be used: 1) system pressure can be limited to the valve's relatively low venting pressure by directing flow from the vent connection to tank; 2) system pressure can be remotely controlled by directing flow from the vent connection to a remote control pressure relief valve such as the C-175 or CGR-02.

The pressure setting of the relief valve selected should be approximately 10 to 14 bar (150 to 200 psi) above actual system working pressure. A higher setting could waste power and put unnecessary loads on the pump and other system components.

High-Flow Designation

A high vent spring must be included in high-flow models of the C*-06 and C*-10. The high-flow option is not available for the CS-03.

Tank Connection

Flow from the T port should be piped directly to the tank to minimize back pressure. Any pressure in the tank line is additive to the pressure setting.

If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur. Contact your Vickers representative for alternatives.

Sequence Valve Configuration

Type "Y" (pressure sequence) versions of the C*-03/06/10 valve are designed for applications that require an adjustable pressure operated valve to control the sequence of flow to another branch of a circuit.

Sequence Operation

When pressure at the inlet port exceeds the valve setting, flow from the pressure inlet is directed to the secondary outlet port. The secondary outlet receives full pressure, and the valve acts as a tee in the line. Reverse free flow connections (secondary outlet to primary inlet) are not provided in this design.

Select an appropriate pressure range for the valve so that the pump and other equipment are not subjected to excessively high working pressures.

These sequence valves perform the same hydraulic circuit function as RS-06 and RS-10 sequence valves. The C*-03/06/10 models, however, are capable of functioning at higher flows and faster sequencing with less pressure overshoot.

Pressure Range

The available pressure ranges for this valve are from 8,5 to 70 bar (125 to 1000 psi), from 35 to 140 bar (500 to 2000 psi), and from 100 to 210 bar (1500 to 3000 psi). Select the appropriate pressure range that will prevent excessively high working pressures from being imposed on the pump and other equipment.

Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning an adjustment knob. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Ratings

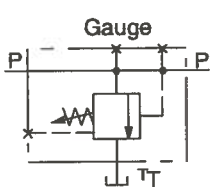
The C*-03/06/10 is rated for a maximum pressure of 210 bar (3000 psi). The following table lists pressure ranges and rated flows for the CS-03, C*-06, and C*-10 standard and high-flow models.

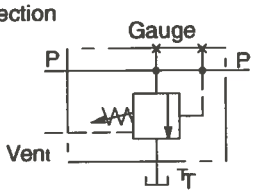
Model	Pressure Range bar (psi)	Rated Flow l/min (USgpm)	
		Standard	High-Flow
CS-03-B*-50	8,5 to 70 (125 to 1000)	175 (45)	—
CS-03-C*-50	35 to 140 (500 to 2000)		
CS-03-F*-50	10 to 210 (1500 to 3000)		
CS/T-06-B*-50	8,5 to 70 (125 to 1000)	227 (60)	340 (90)
CS/T-06-C*-50	35 to 140 (500 to 2000)		
CS/T-06-F*-50	100 to 210 (1500 to 3000)		
CS/T-10-B*-30	8,5 to 70 (125 to 1000)	454 (120)	680 (180)
CS/T-10-C*-30	35 to 140 (500 to 2000)		
CS/T-10-F*-30	100 to 210 (1500 to 3000)		

Graphical Symbols

Relief Valves

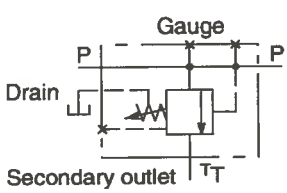
Using Vent Connection

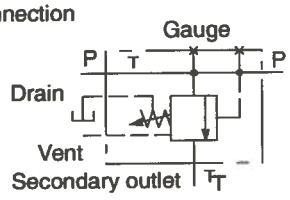




Sequence Valves

Using Vent Connection



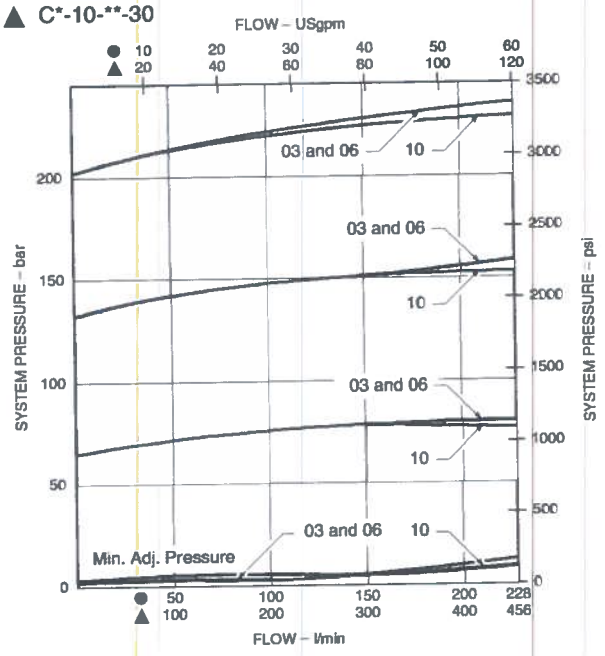


Series C*-03/06/10 Relief/Sequence Valves

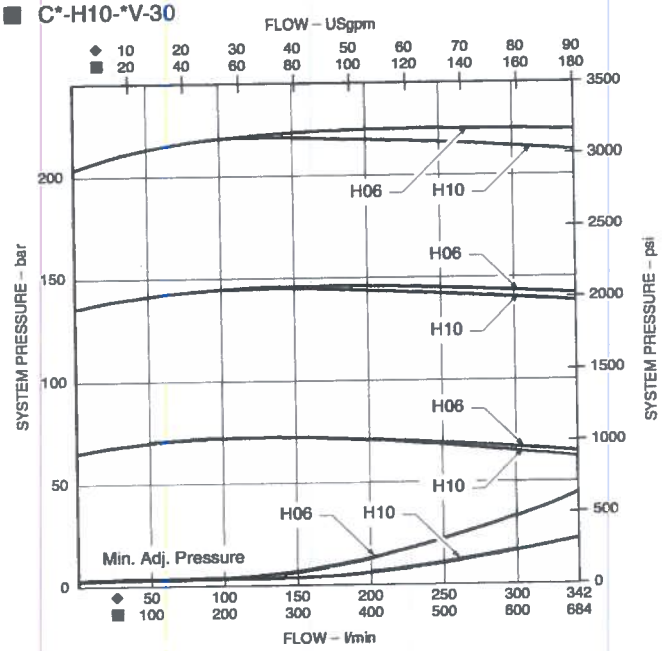
Performance Curves

Nominal Override Characteristics

● C*-03/06-**-50
▲ C*-10-**-30

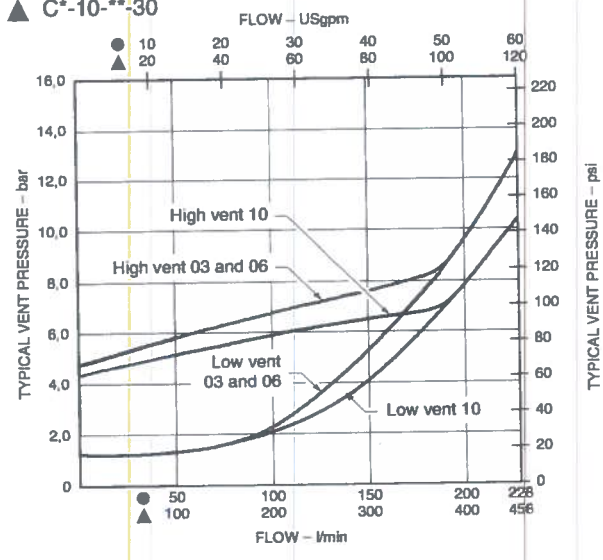


◆ C*-H06-*V-50
■ C*-H10-*V-30

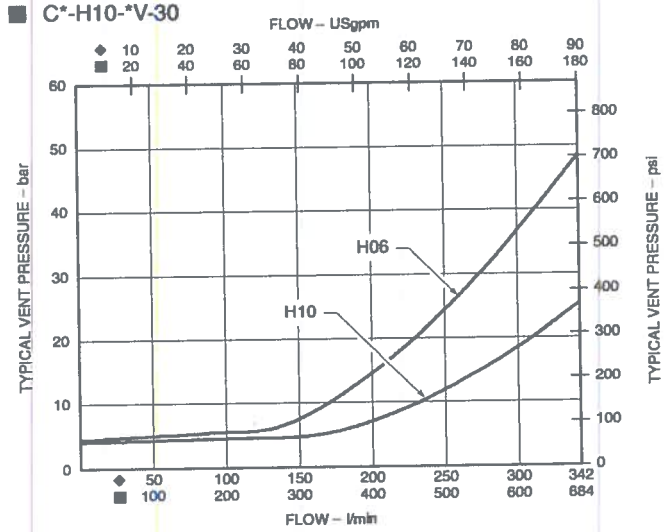


Vent Pressure Versus Flow

● C*-03/06-**-50
▲ C*-10-**-30

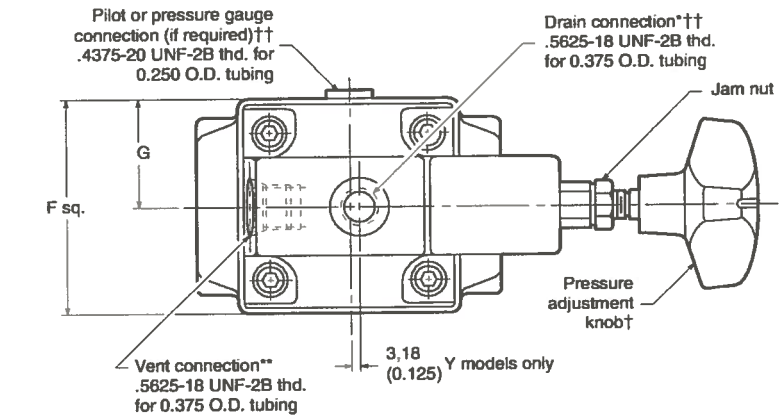

FLOW – USgpm
● 10 20 30 40 50 60
▲ 20 40 60 80 100 120
TYPICAL VENT PRESSURE – bar
TYPICAL VENT PRESSURE – psi
High vent 10
High vent 03 and 06
Low vent
03 and 06
Low vent 10
● 50 100 150 200 228
▲ 100 200 300 400 456
FLOW – l/min

◆ C*-H06-*V-50
■ C*-H10-*V-30



Installation Dimensions

mm (inch)



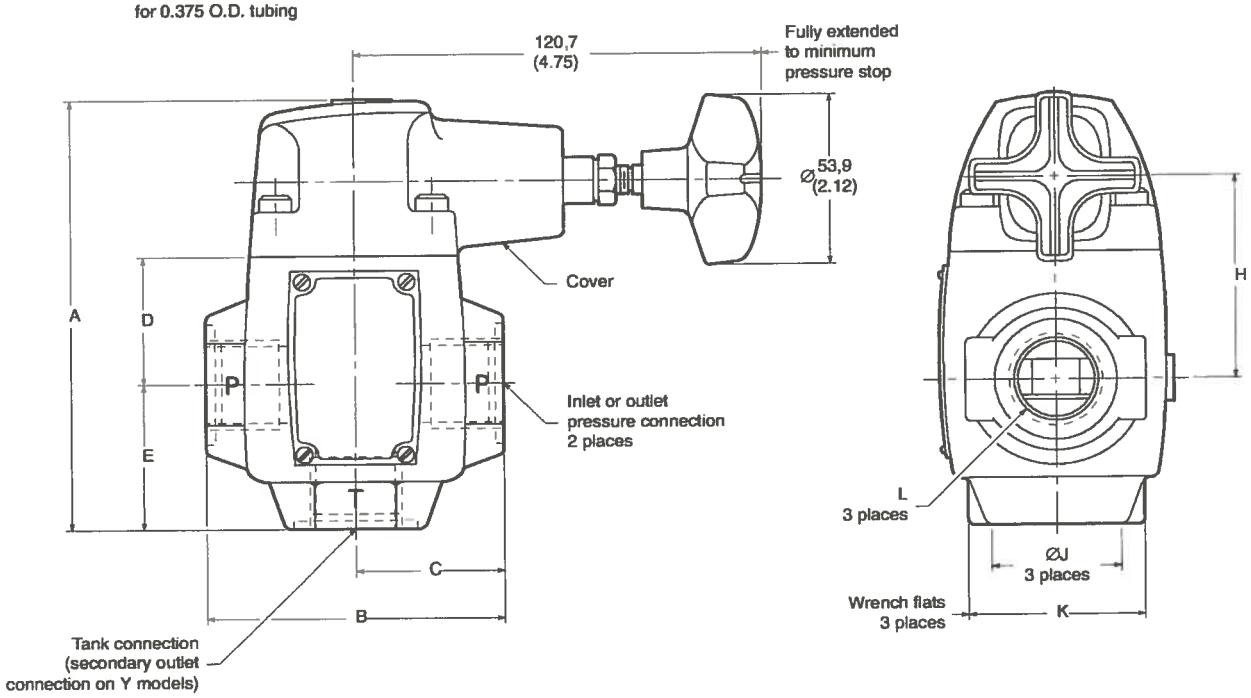
Notes

* Drain connection on Y models only. Not available in 03 size valve. Connect directly to tank. Pressure at drain port is additive to pressure setting.

** Leave plugged except when circuit indicates connection for venting or remotely controlling valve.

† Knob can be backed out beyond minimum pressure stop. Reposition knob (if desired) to any 90° increment by reinstalling cover.

††Per SAE Standard J-514.



Model	A	B	C	D	E	F	G	H	J	K	L – System Connections: CS Models	L – System Connections: CT Models††
CS-03	143,3 (5.64)	95,5 (3.76)	47,8 (1.88)	39,9 (1.57)	55,6 (2.19)	65,6 (2.58)	32,8 (1.29)	62,0 (2.45)	45,7 (1.80)	53,9 (2.12)	.875-14 UNF-2B thd. (0.625 O.D. tubing)	Not available in 03 size valve
CS-06 CT-06											1.0625-12 UN-2B thd. (0.750 O.D. tubing)	$^{3}/_{4}$ NPTF thd.††
CS-10 CT-10	157,2 (6.18)	124,0 (4.88)	61,9 (2.44)	41,2 (1.62)	61,9 (2.44)	83,3 (3.28)	41,7 (1.64)	66,5 (2.62)	61,9 (2.44)	69,9 (2.75)	1.6250-12 UN-2B thd. (1.250 O.D. tubing	$1^{1}/_{4}$ NPTF thd.††

†† Not recommended

Series CG-06/10 Relief/Sequence Valves

Model Code

(F3) CG - (H) 06 - C (V) (Y) - 50

1 2 3 4 5 6 7 8

1 Seals

F3 – For mineral oil and fire resistant fluids
Blank – Omit if not required

2 Model Series

C – Relief valve
G – Subplate mounted

3 High-flow Designation

H – High-flow valve (available in relief valves only)
Blank – Omit if not required (and for sequence valves)

4 Valve Size

06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or $^3/_4$" pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or $1^1/_4$" pipe

5 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)

6 High Vent Spring

V – Optional high vent spring installed (required in high-flow models)
Blank – Omit if not required

7 Sequence Valve Designation

Y – Configured as sequence valve
Blank – Omit for relief valve

8 Design Number

50 – For 06 size valve
30 – For 10 size valve

Subject to change. Installation dimensions same for designs 30 through 39 and for designs 50 through 59.

General Information

The series CG-06/10 valve is designed for manifold or subplate mounting and can be ordered as either a pressure relief valve or a sequence valve.

Minimum venting pressure (see curves on page 22) designates the pressure at which the valve operates (regardless of adjustment) when the vent connection is open to tank. This action is sometimes required during a part of a cycle. Use only when indicated by circuit.

Relief Valve Configuration

The CG-06/10 is designed for use in applications requiring an adjustable pressure relief or regulating valve to limit the pressure in a hydraulic circuit to a desired maximum.

In addition to conventional relief valve operation, two other functional modes can be used: 1) system pressure can be limited to the valve's relatively low venting pressure by directing flow from the vent connection to tank; 2) system pressure can be remotely controlled by directing flow from the vent connection to a remote control pressure relief valve such as the C-175 or CGR-02.

The pressure setting of the relief valve selected should be approximately 10 to 14 bar (150 to 200 psi) above actual system working pressure. A higher setting could waste power and put unnecessary loads on the pump and other system components.

High-Flow Designation

A high vent spring must be included in high-flow models of the CG-06 and CG-10.

Tank Connection

Flow from the T port should be piped directly to the tank to minimize back pressure. Any pressure in the tank line is additive to the pressure setting.

If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur. Contact your Vickers representative for alternatives.

Sequence Valve Configuration

Type "Y" (pressure sequence) versions of the CG-06/10 valve are designed for applications that require an adjustable pressure operated valve to control the sequence of flow to another branch of a circuit.

Sequence Operation

When pressure at the inlet port exceeds the valve setting, flow from the pressure inlet is directed to the secondary outlet port. The secondary outlet receives full pressure. Reverse free flow connections (secondary outlet to primary inlet) are not provided in this design.

Select an appropriate pressure range for the valve so that the pump and other equipment are not subjected to excessively high working pressures.

These sequence valves perform the same hydraulic circuit function as RG-06 and RG-10 sequence valves. The CG-06/10 models, however, are capable of functioning at higher flows and faster sequencing with less pressure overshoot.

Drain Connection

The drain connection should be piped directly to the tank to minimize back pressure. Any pressure in the drain line is additive to the pressure setting.

Pressure Range

The available pressure ranges for this valve are from 8,5 to 70 bar (125 to 1000 psi), from 35 to 140 bar (500 to 2000 psi), and from 100 to 210 bar (1500 to 3000 psi). Select an appropriate pressure range for the valve so that the pump and other equipment are not subjected to excessively high working pressures.

Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning an adjustment knob. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Mounting Adapter Plates

Two relief valve mounting adapter plates (see page 26) are available to adapt current design relief valves to the -10 design mounting. The CGAM-06-20 adapts a CG-(H)06-*(V)-5* valve to a CG-06-*(V)-10 mounting. The CGAM-10-20 adapts a CG-(H)10-*(V)-3* valve to a CG-06-*(V)-10 mounting.

The following bolt kits are used with mounting adapter plates to mount CG-06/10 valves:

Valve	Bolt Kit
CG-(H)06-*(V)-5*	BKCGAM06608
CG-(H)10-*(V)-3*	BKCGAM10609†

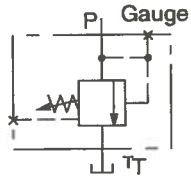
† Holds only adapter plate to mounting pad or subplate. Separate bolt kit needed to mount relief valve to adapter plate.

Ratings

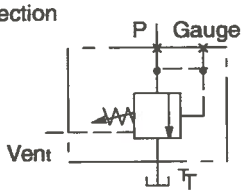
The CG-06/10 is rated for a maximum pressure of 210 bar (3000 psi). The following table lists pressure ranges and rated flows for the CG-06 and CG-10 standard and high-flow models.

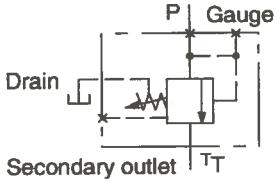
Model	Pressure Range bar (psi)	Rated Flow l/min (USgpm)	
		Standard	High-Flow
CG-06-B*-50	8,5 to 70 (125 to 1000)	227 (60)	340 (90)
CG-06-C*-50	35 to 140 (500 to 2000)		
CG-06-F*-50	100 to 210 (1500 to 3000)		
CG-10-B*-30	8,5 to 70 (125 to 1000)	454 (120)	680 (180)
CG-10-C*-30	35 to 140 (500 to 2000)		
CG-10-F*-30	100 to 210 (1500 to 3000)		

Graphical Symbols

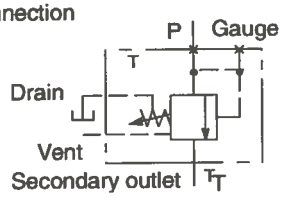


Relief Valves
Using Vent Connection





Sequence Valves
Using Vent Connection

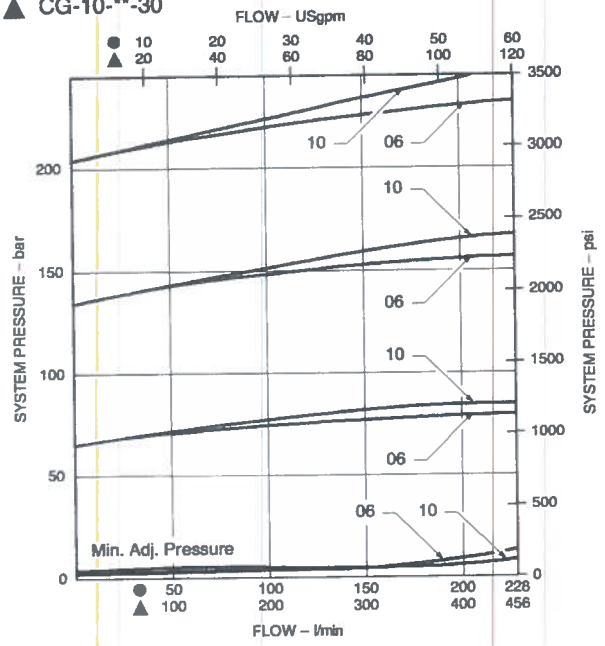


Series CG-06/10 Relief/Sequence Valves

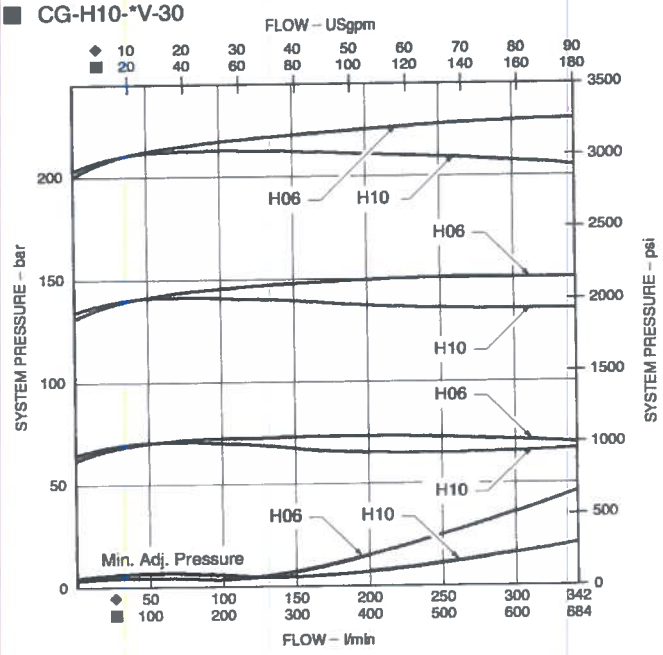
Performance Curves

Nominal Override Characteristics

● CG-06-**-50
▲ CG-10-**-30

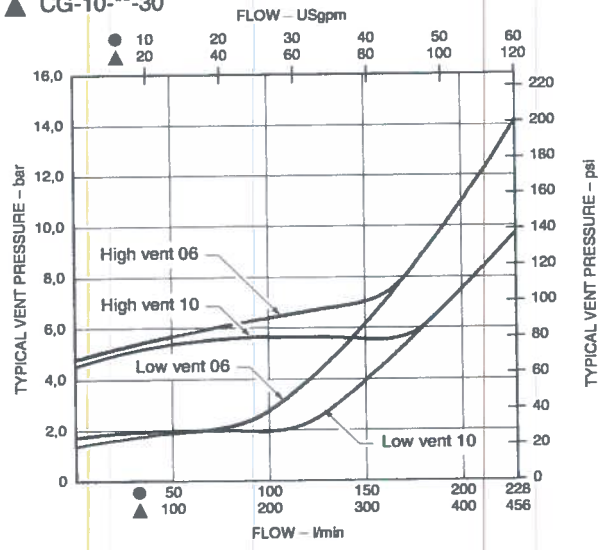


◆ CG-H06-*V-50
■ CG-H10-*V-30

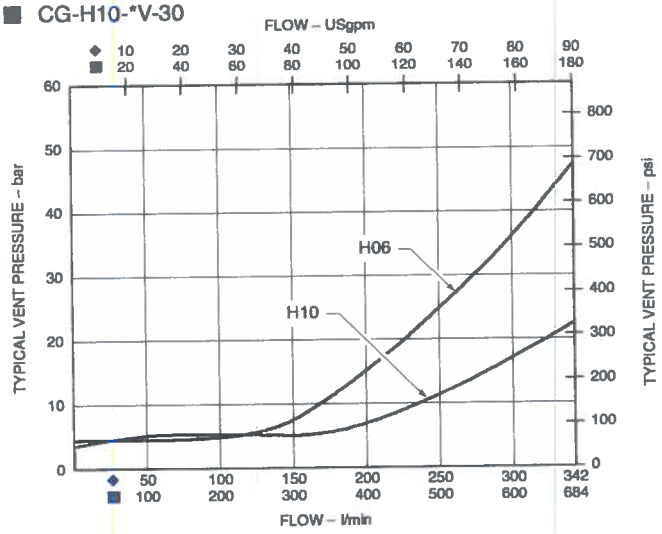


Vent Pressure Versus Flow

● CG-06-**-50
▲ CG-10-**-30

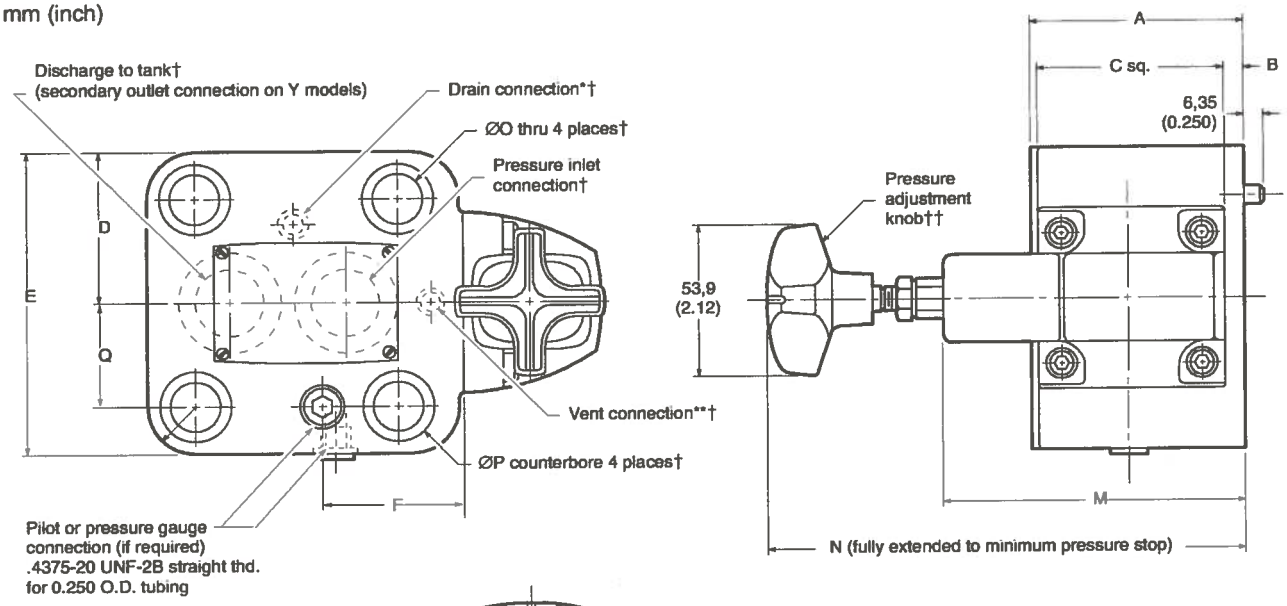


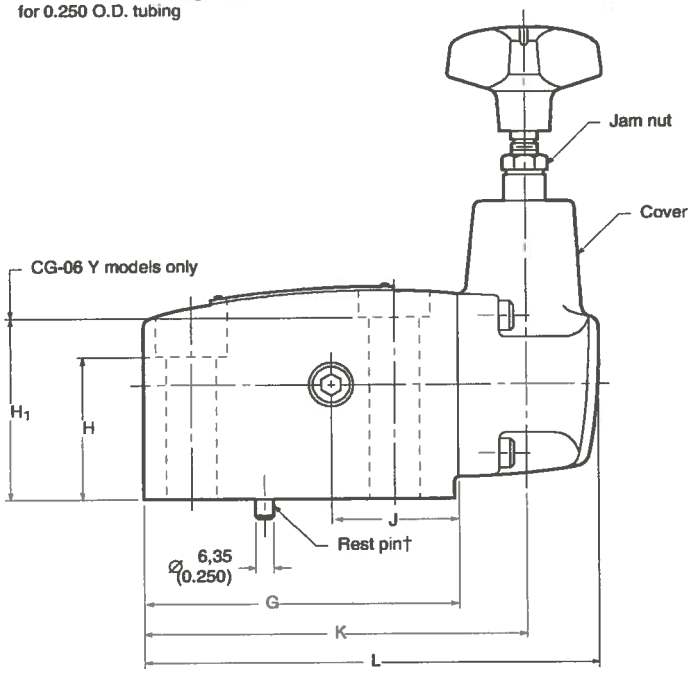
◆ CG-H06-*V-50
■ CG-H10-*V-30



Installation Dimensions

mm (inch)





Note

* Drain connection on Y models only. Connect directly to tank. Pressure at drain port is additive to pressure setting.

** Leave plugged except when circuit indicates connection for venting or remotely controlling valve.

† See dimensions of applicable subplate (page 24) for location.

†† Knob can be backed out beyond minimum pressure stop. Reposition knob (if desired) 90° up or down from position shown by reinstalling cover (except on Y models).

Model	A	B	C	D	E	F	G	H	H_1	J	K	L	M	N
CG-06	71,4 (2.81)	7,9 (0.31)	62,0 (2.44)	53,3 (2.10)	106,4 (4.19)	47,8 (1.88)	107,2 (4.22)	47,8 (1.88)	60,5 (2.38)	42,9 (1.69)	131,1 (5.16)	156,5 (6.16)	100,8 (3.97)	159,5 (6.28)
CG-10	85,9 (2.81)	2,3 (0.31)	81,0 (2.44)	66,8 (2.63)	133,4 (5.25)	55,6 (2.19)	116,1 (4.57)	63,5 (2.50)	N/A	50,8 (2.00)	141,5 (5.57)	164,6 (6.48)	104,7 (4.12)	163,6 (6.44)

Model	O	P	Q
CG-06	16,6 (0.65)	24,5 (0.96)	35,1 (1.38)
CG-10	19,8 (0.78)	29,3 (1.15)	46,0 (1.81)

Series CG-06/10 Relief/Sequence Valves

Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG-06-B-50 valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, $^5/_8$-11 x 2.75")

When a subplate is not used, a machined pad (shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch).

If mounting bolts are provided by the customer, they should be SAE grade 7 or better.

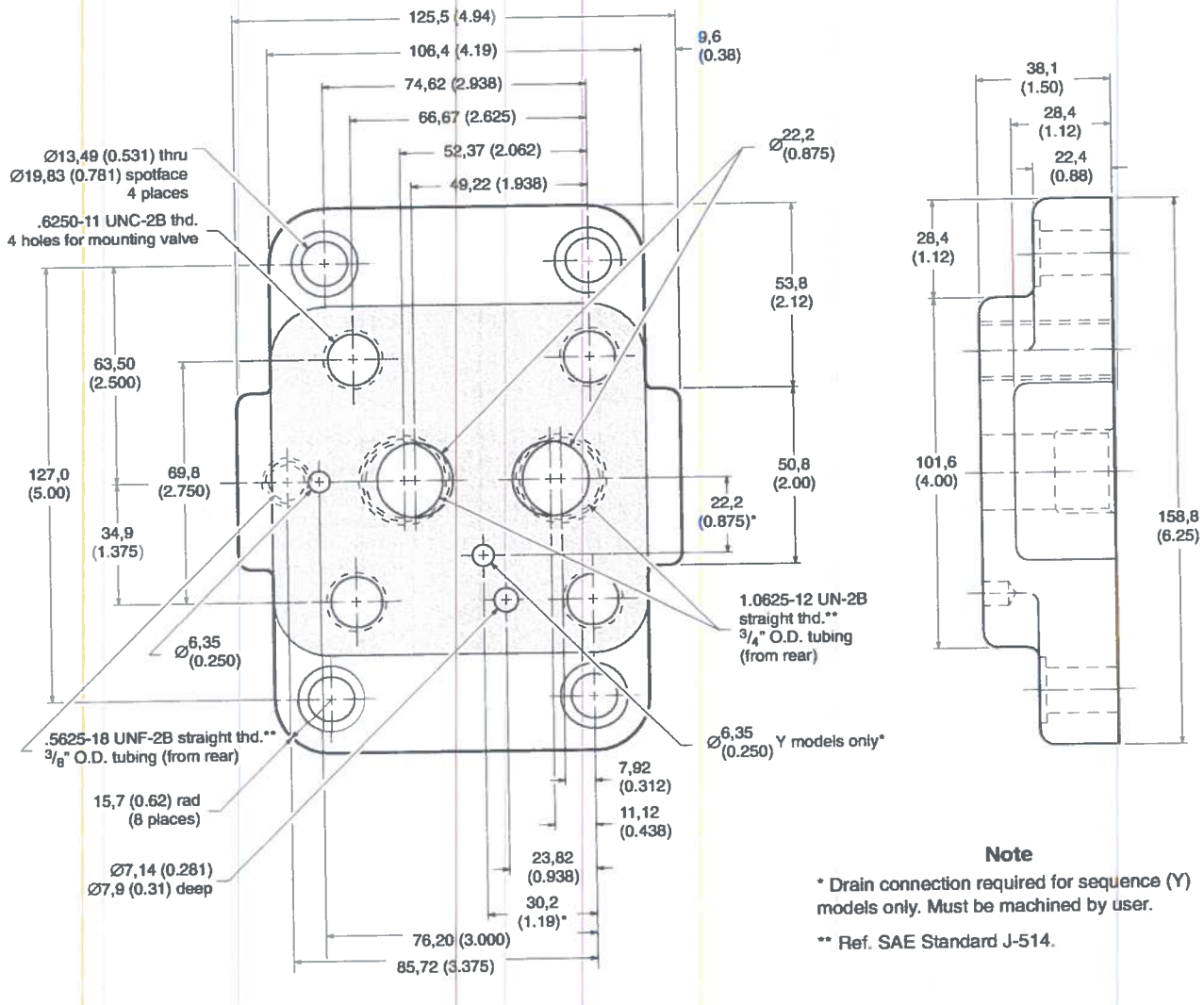
The following bolt kits are used to mount CG-06/10 valves:

Valve	Bolt Kit
CG-(H)06-*(V)-5*	BKCG06604
CG-06-*(V)Y-5*	BKCG06605
CG-(H)10-*(V)-3*	BKCG10616
CG-10-*(V)Y-3*	BKCG10616

Mounting Subplates

mm (inch)

CGM-06S-20 (for $^3/_4$" O.D. tubing)



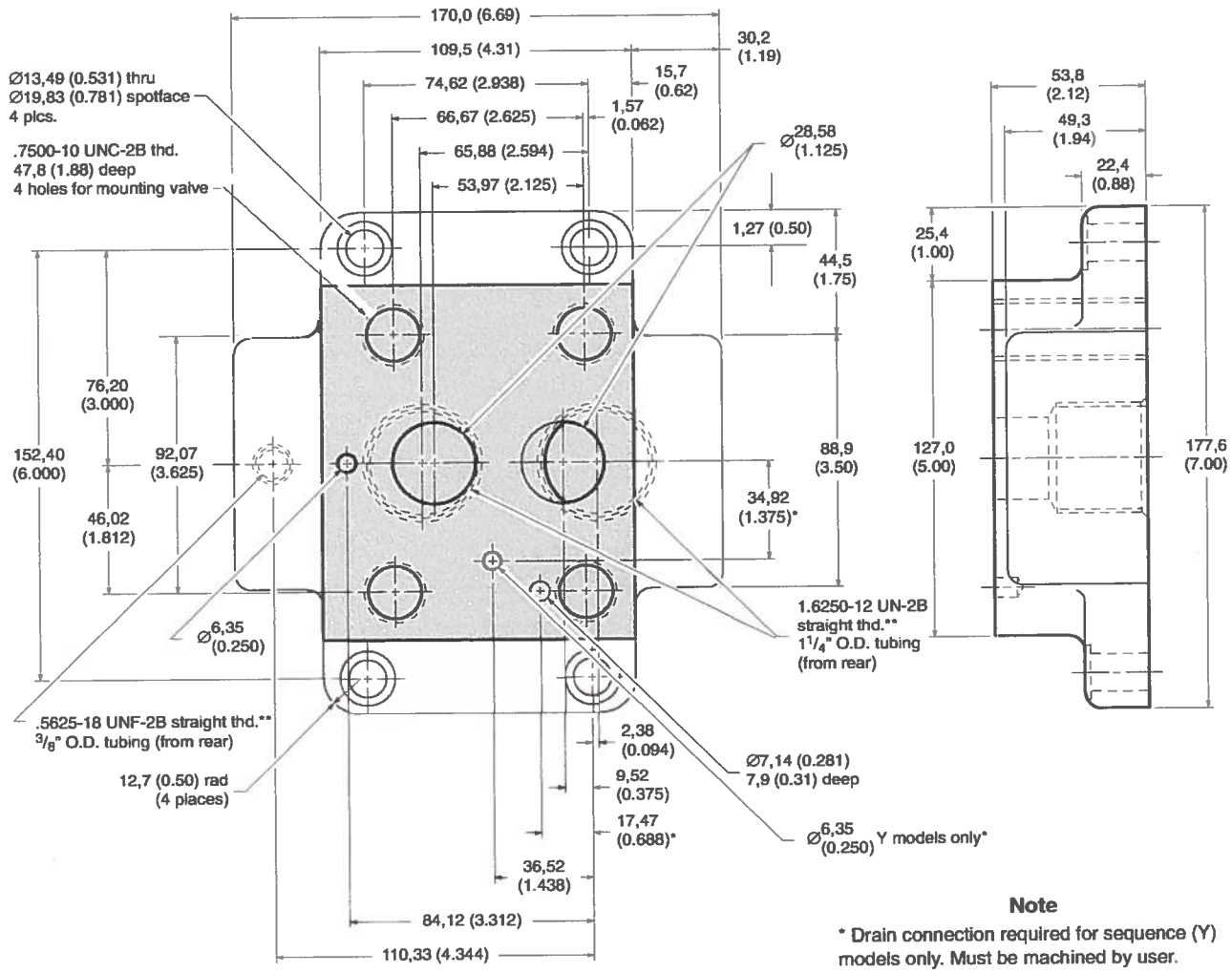
Note

* Drain connection required for sequence (Y) models only. Must be machined by user.

** Ref. SAE Standard J-514.

CGM-10S-20 (for $1^1/_4$" O.D. tubing)

mm (inch)



Note

* Drain connection required for sequence (Y) models only. Must be machined by user.

** Ref. SAE Standard J-514.

Series CGAM-06/10 Adapter Mounting Plates

Model Code

CGAM - 06 - 20

1 2 3

1 Model Series

C – Relief valve
G – Subplate mounted
A – Adapter
M – Mounting plate

2 Compatible Valve Size

06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or $^3/_4$" pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or $1^1/_4$" pipe

3 Design Number

Subject to change. Installation dimensions same for designs 20 through 29.

General Information

CGAM-06/10 adapter mounting plates are designed for adapting new, improved valves to the subplate or machined mounting pad used by a superseded valve.

Adapter Mounting Plate	Superseded Valve	New Valve
CGAM-06-20	CG-06-**-10	CG-06-**-20 and up
	CG5-06**-**-20	CG5-06**-**-30 and up
CGAM-10-20	CG-10-**-10	CG-10-**-20 and up
	CG5-10**-**-20	CG5-10**-**-30 and up

Mounting Bolts

Mounting bolts are not included with adapter plates and must be ordered separately.

Examples:
(1) CGAM-06-20 mounting adapter plate
(1) BKCGAM06608 bolt kit (consisting of four bolts, $^5/_8$-11 x 3.50")

(1) CGAM-10-20 mounting adapter plate
(1) BKCGAM10609 bolt kit (consisting of four bolts, $^3/_4$-10 x 2.50")

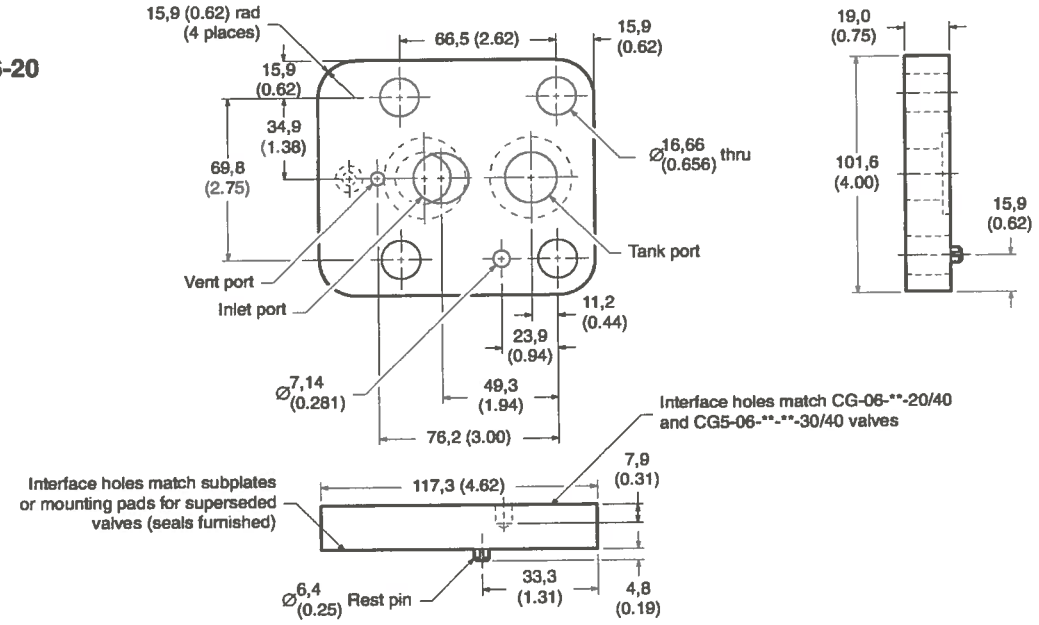
Mounting bolts for the CGAM-06-20 hold *both* the relief valve and the adapter plate to a mounting pad or subplate. Mounting bolts for the CGAM-10-20 hold *only* the adapter plate to a mounting pad or subplate. A separate bolt kit is needed to mount the relief valve to the adapter plate.

If mounting bolts are provided by the customer, they should be SAE grade 7 or better.

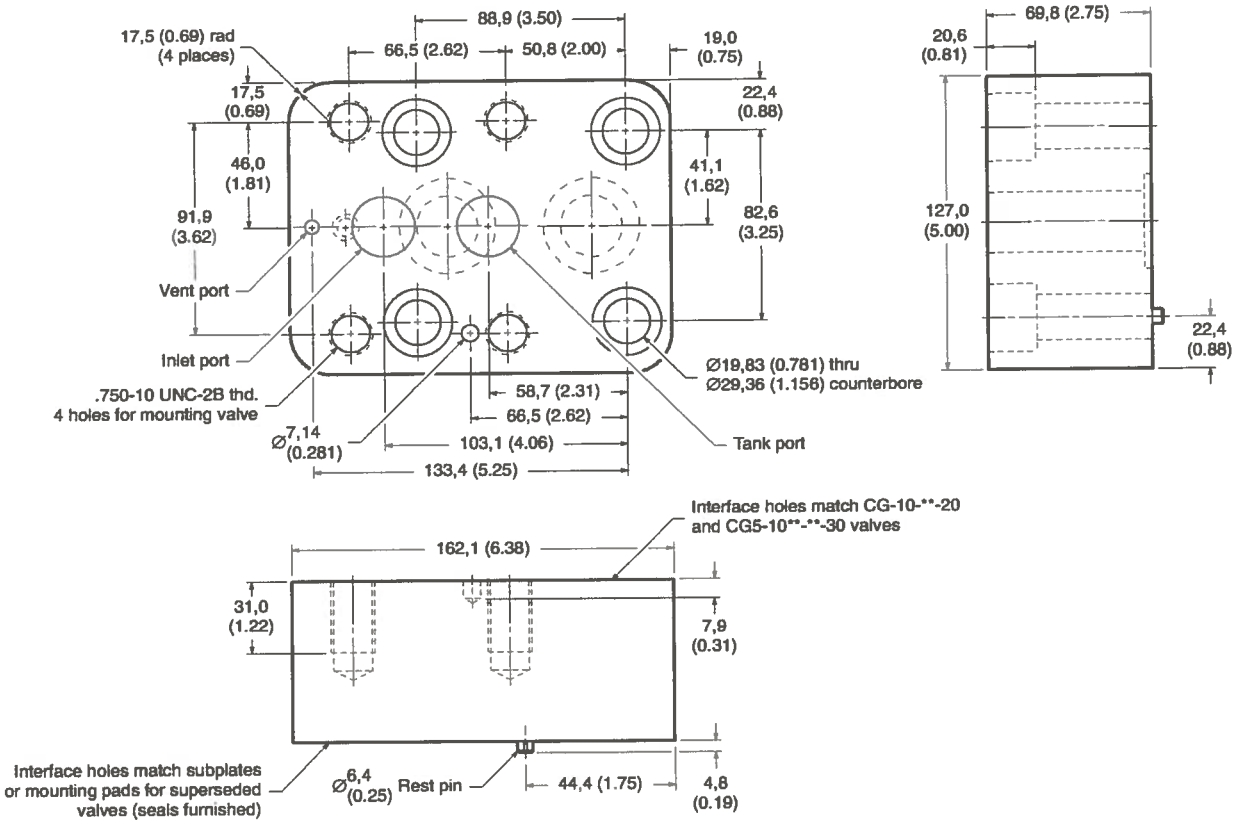
Installation Dimensions

mm (inch)

CGAM-06-20



CGAM-10-20



Series C*5-03/06/10 Pilot Operated Relief Valves

Model Code

(F3) C S 5 - (H) 06 2 A (P) C (V) - M (S1) (PA5) - W (L) - B (9) - P08 - 100

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

1 Seals

F3 – For CG5 all internal seals are F3. Interface seals are Buna-N. Add prefix F3 to model for use with synthetic fluids.
Blank – Omit for CS5 and CT5 (all seals are F3 as standard)

2 Valve Type

C – Relief valve

3 Connections

G – Manifold or subplate mounting (not available in 03 size valve)
S – SAE straight thread
T – NPTF thread* (not available in 03 size valve)

*Not recommended

4 Control Type

5 – Solenoid controlled (pilot operated)

5 High-flow Designation

H – High-flow valve (not available in CT models)
Blank – Omit if not required

6 Valve Size

03 – .8750-14 UNF-2B straight thread (0.625 tubing)
06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or $^{3}/_{4}$" pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or $1^{1}/_{4}$" pipe

7 Pilot Spool Function

0, 1, or 2 – Indicates venting condition. See Graphical Symbols on page 31.

8 Pilot Spool Spring Arrangement

A – Spring offset
C – Spring centered
F – Energize to center

9 Manual Override

P – Plain override in end cap (single solenoid models only)
Blank – Omit if not required

10 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)

11 High Vent Spring

V – Optional high vent spring installed (required in high-flow models)
Blank – Omit if not required

12 Flag Symbol

M – Electrical options and features

13 Spool Indicator Switch

For spring offset (A) models only. Not available in manual override models.
S – Switch unwired
S1 – Switch wired normally open
S2 – Switch wired normally closed

14 Electrical Connections

PA3 – 3-pin receptacle (single solenoid models only)
PA5 – 5-pin receptacle
PB – "Insta-Plug" with male and female connectors
Blank – Omit if not required

15 Housing

U – ISO 4400 (DIN 43650) connector (For use with indicator lights, contact your Vickers representative.)
W – $^{1}/_{2}$" NPT thread wiring housing
WL – $^{1}/_{2}$" NPT thread wiring housing with coil indicator lights

16 Coil Voltage Rating

B – 115/120V AC 60 Hz and 110V AC 50 Hz
D – 230V AC 60 Hz and 220/230V AC 50 Hz
F – 6V DC
G – 12V DC
H – 24V DC

17 Coil Wattage

9 – Low wattage coil (B coil only)
Blank – Omit if not required

18 Pilot Valve Port Orifices

***00** – Solid plug
***03** – 0,30 (0.012)
***06** – 0,60 (0.024)
***08** – 0,80 (0.030)
***10** – 1,00 (0.040)
***13** – 1,30 (0.050)
***15** – 1,50 (0.060)
***20** – 2,00 (0.080)
***23** – 2,30 (0.090)
Blank – Omit if not required

* = P, T, A, or B as required

19 Design Number

100 – For CS5 and CT5 models (using DG4V-3S pilot valve)
110 – For CG5 models (using DG4V-3 high performance pilot valve)

Subject to change. Installation dimensions same for designs 100 through 109 and for designs 110 through 119.

General Data

All valves are of the patented Vickers balanced piston type construction. These valves are generally used for applications requiring an electrically controlled adjustable pressure relief or regulating valve to limit the pressure in an oil circuit to the desired maximum.

Pressure Adjustment

Select pressure range so that excessively high working pressures will not be imposed upon pump or other equipment.

Adjustment of pressure is accomplished by loosening jam nut and turning adjusting screw. Clockwise rotation increases pressure; counterclockwise rotation decreases pressure.

Application Guidance

High Flow Valve ("H" Model)

"H" series valves require use of a high vent spring (C*5-(H)06/10**-*V-**-*-1**).

Typical Spool Shift Time

Note

Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation and, therefore, should be cycled periodically to prevent this from happening.

Following is typical spool shift time* for spring offset and spring centered models (rated flow and pressure):

Solenoid Energized	
AC	12 ms
DC	30 ms
Spring Return	
AC (all spools except 2)	22 ms
AC (type 2) and DC (all models)	45 ms
Offset to Offset on Spring Centered Models	
AC	25 ms
DC	60 ms
Maximum Cycling Rate (all spool positions actuated once/cycle)	
AC	4 Hz
DC	3 Hz

* Shift times apply to solenoid pilot valve only.

Installation Data

Tank Connection

The tank connection should be piped directly to tank to minimize back pressure. Any back pressure in the tank line is additive to the valve pressure setting. If tank line back pressure exceeds system pressure by 7,0 bar (100 psi), a malfunction may occur. Transient pressure peaks in the tank line must not exceed155 bar (2250 psi).

Note

Surges of oil in a common tank line serving these and other valves can be of sufficient magnitude to cause inadvertent shifting of the pilot spool of the valves. Separate tank lines or a vented manifold with a continuous downward path to tank is necessary.

Mounting

Mounting orientation is unrestricted.

Electrical Information

AC solenoids furnished with this valve are dual frequency types (as shown in the table on page 30). They also resist burn-out, which allows time to find and correct problems before solenoid burn-out occurs.

Solenoids

Solenoids are identified by a letter in the model number. Example: CG5-062C-B-M-W-B-110.

Note

Solenoids are designed to function continuously at ±10% of rated voltage.

Note

On all models, when solenoid "A" is energized, flow is always P→A. When solenoid "B" is energized, flow is always P→B. This is in accordance with ANSI-B93.9 standard. Solenoid "A" and "B" are identified on diagram on top of valve. This orientation is reversed for left hand "L" models.

Ratings

Rated Pressure (Maximum)	210 bar (3000 psi)
Rated Capacity (Maximum)	
CS5-03 & C*5-06	227 l/min (60 USgpm)
C*5-H06	340 l/min (90 USgpm)
C*5-10	454 l/min. (120 USgpm)
C*5-H10	680 l/min (180 USgpm)

Series C*5-03/06/10 Pilot Operated Relief Valves

Solenoid Energizing

Spring centered and spring offset types will be spring positioned unless solenoid is energized continuously.

The conduit connection readily adapts to connector receptacle assemblies on the market.

Electrical Connection Note

1/2 NPT thread for C*5(H)****-M-W*-90 models is provided on both ends of the wiring box. the wiring box is a NEMA type 4 enclosure.

Solenoid Indicator Lights

Light is "on" when there is current at the coil. Lights are available for most AC and DC voltages.

Lead wire insulation	Class "H" on both AC and DC solenoid lead wires

Wiring

The electrical connections to the valve are made in the electrical wiring housing. Two lead wires for each solenoid, approximately 153,0mm (6.00 in.) long, with M3 (No. 6) size terminals are provided for customer connection. A ground terminal is also provided.

Seals

Threaded Valves:

All seals used in the threaded valves are fluorocarbon as standard and are suitable for use with phosphate ester type fluids or its blends, water glycol, water-in-oil emulsions, and petroleum oil.

Subplate Mounted Valves:

Standard models are furnished with Buna-N seals for the mounting surface and may be used with water glycol, water-in-oil emulsions, and petroleum oil. Internal seals are fluorocarbon. The use of phosphate ester or its blends requires an F3 model. All seals of the F3 models are fluorocarbon, including the mounting surface seals.

Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG5-062C-F-M-W- * -110 valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, $^5/_8$-11 x 2.75")

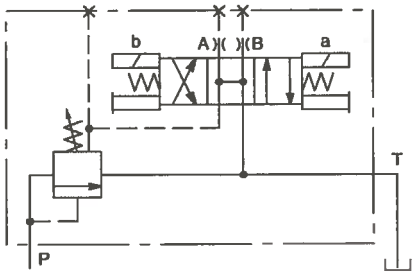
CGM-06S-20 and CGM-10S-20 subplate installation dimensions are shown in CG-06/10 section. When a subplate is not used, a machined pad (as indicated by subplate shaded area on pages 24 and 25) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

Solenoid Voltage Rating	Identification Letter	Inrush amps (R.M.S.)*	Holding amps	Holding watts	Resistance ohms @20°C	Inductance mH
115/120V AC 60 Hz	B	2.0	0.54	31	33.5	185
110V AC 50 Hz			0.64			
230/240V AC 60 Hz	D	1.0	0.27	31	140	731
220V AC 50 Hz			0.32			
24V AC 60 Hz	N	7.8	2.45	27	1.60	57
24V AC 50 Hz		8.4	3.15	35		
115/120V AC 60 Hz	B9 (Low Watt)	1.5	0.31	17	55.0	285
110V AC 50 Hz			0.37	21		
110V AC 60 Hz	T	1.9	0.66	27	23.1	150
110V AC 50 Hz		2.1	0.85	35		
6V DC	F	—	6.8	41	0.88	4.07
12V DC	G	—	3.5	41	3.45	16.3
24V DC	H	—	1.7	41	13.9	64.6
32V DC	DK	—	1.3	41	24.7	114
48V DC	J	—	0.87	41	55.3	258

* Maximum peak inrush amps approximately 1.4 x R.M.S value shown

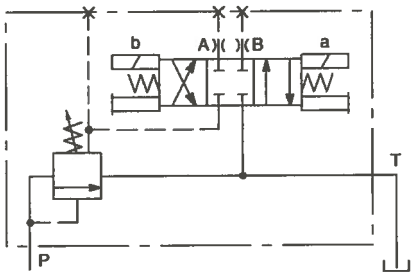
Graphical Symbols

Model C*5-(H)**0C (DG4V-3-0C Pilot)



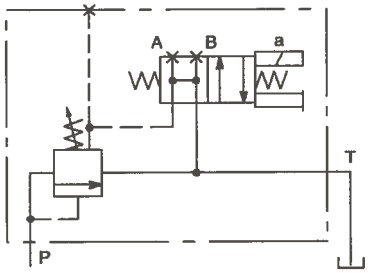
When solenoid "A" is energized, control is at connection "A". When solenoid "B" is energized, control is at connection "B". When both solenoids are de-energized, valve is vented.

Model C*5-(H)**2C (DG4V-3-2C Pilot)



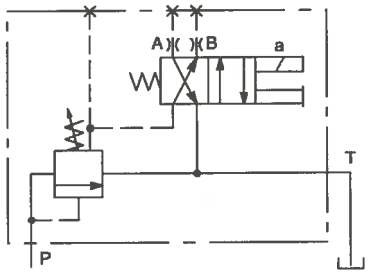
When solenoid "A" is energized, control is at connection "A". When solenoid "B" is energized, control is at connection "B". When both solenoids are de-energized, control is by integral adjustment.

Model C*5-(H)**0A (DG4V-3-0BL Pilot)



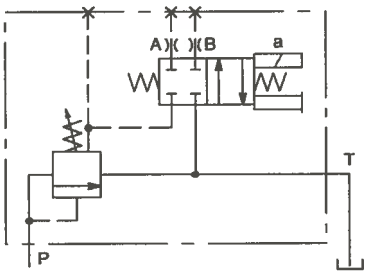
When solenoid "A" is energized, control is by integral adjustment. When solenoid "A" is de-energized, valve is vented.

Model C*5-(H)**1A (DG4V-3-2AL Pilot)



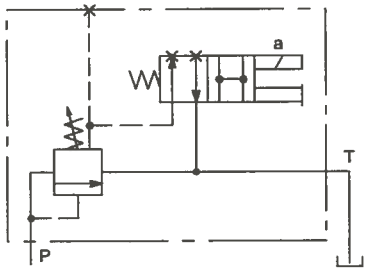
When solenoid "A" is energized, control is at connection "A". When solenoid "A" is de-energized, control is at connection "B".

Model C*5-(H)**2A (DG4V-3-2BL Pilot)



When solenoid "A" is energized, control is at connection "A". When solenoid "A" is de-energized, control is by integral adjustment.

Model C*5-(H)**0F (DG4V-3-0FL Pilot)



When solenoid "A" is energized, valve is vented. When solenoid "A" is de-energized, control is by integral adjustment.

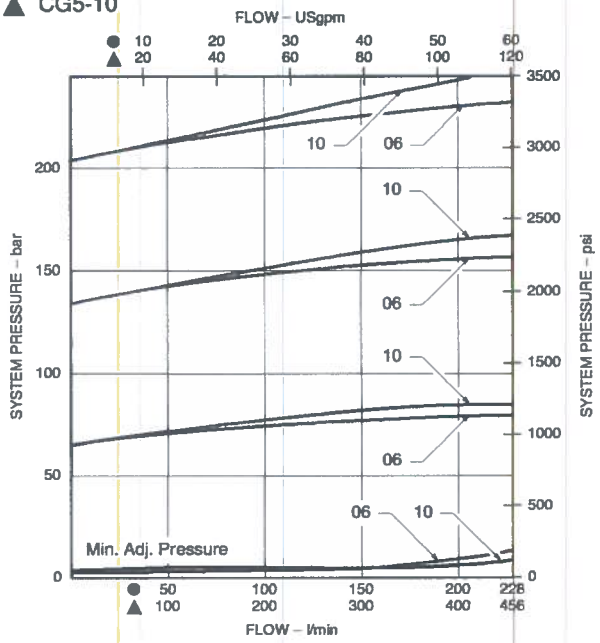
Series C*5-03/06/10 Pilot Operated Relief Valves

Performance Curves

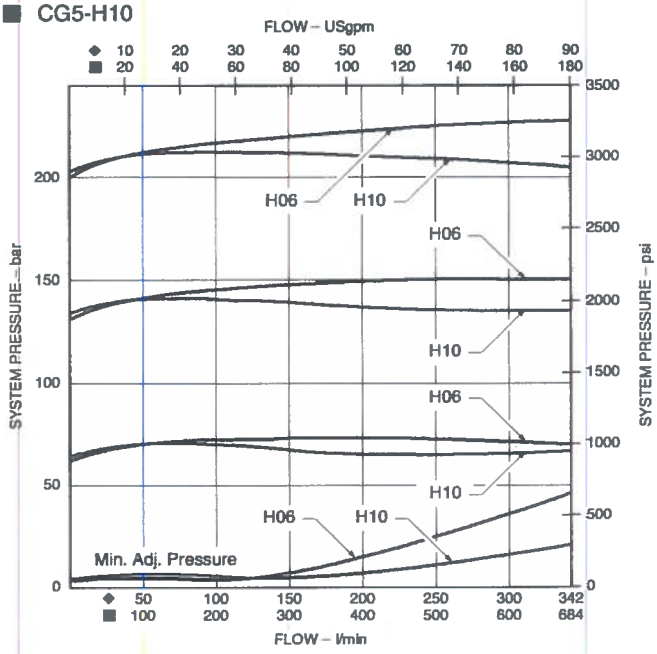
Subplate or Manifold Mounted Models

Nominal Override Characteristics

● CG5-06
▲ CG5-10

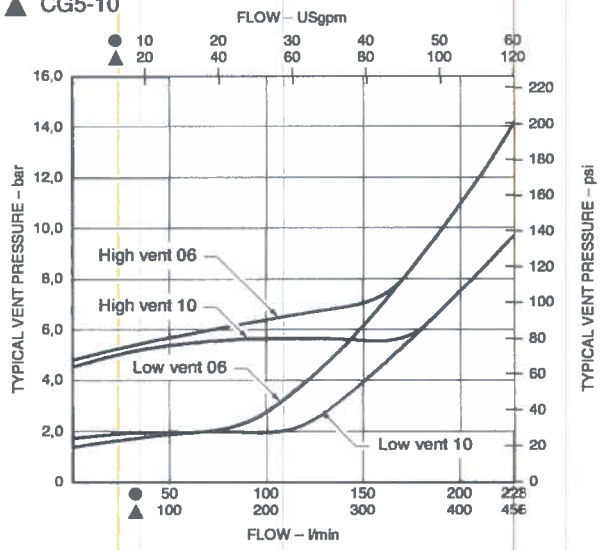

FLOW – USgpm
● 10 20 30 40 50 60
▲ 20 40 60 80 100 120
SYSTEM PRESSURE – bar
SYSTEM PRESSURE – psi
10
06
Min. Adj. Pressure
● 50 100 150 200 228
▲ 100 200 300 400 456
FLOW – l/min

◆ CG5-H06
■ CG5-H10

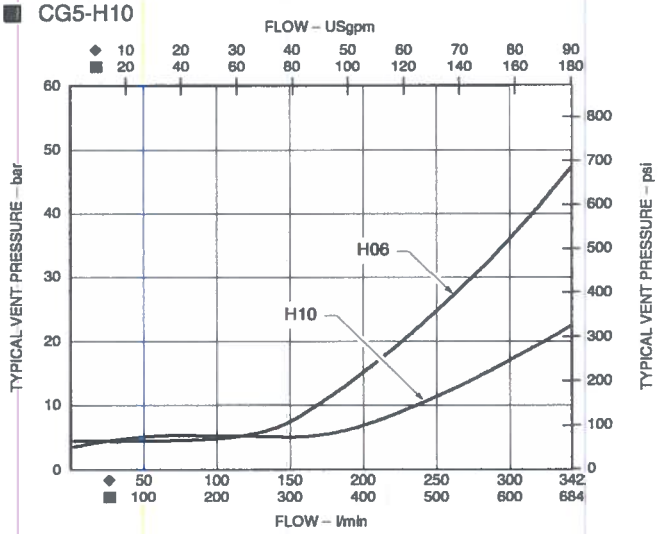


Vent Pressure Versus Flow*

● CG5-06
▲ CG5-10


FLOW – USgpm
● 10 20 30 40 50 60
▲ 20 40 60 80 100 120
TYPICAL VENT PRESSURE – bar
TYPICAL VENT PRESSURE – psi
High vent 06
High vent 10
Low vent 06
Low vent 10
● 50 100 150 200 228
▲ 100 200 300 400 456
FLOW – l/min

◆ CG5-H06
■ CG5-H10

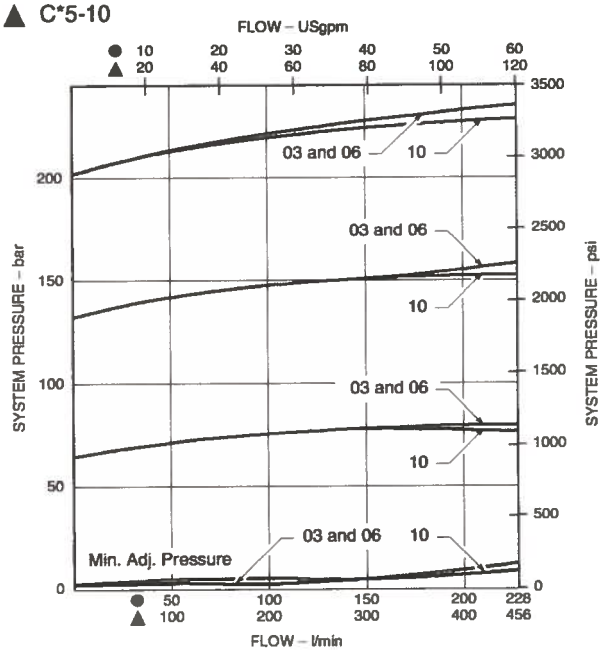


* Valves supplied with external pilot connections (model designation "0C", "2C", "1A", and "2A") have an integral damping orifice. If these models are vented through their pilot connections, the vent pressures will be approximately 1,7 bar (25 psi) higher than shown.

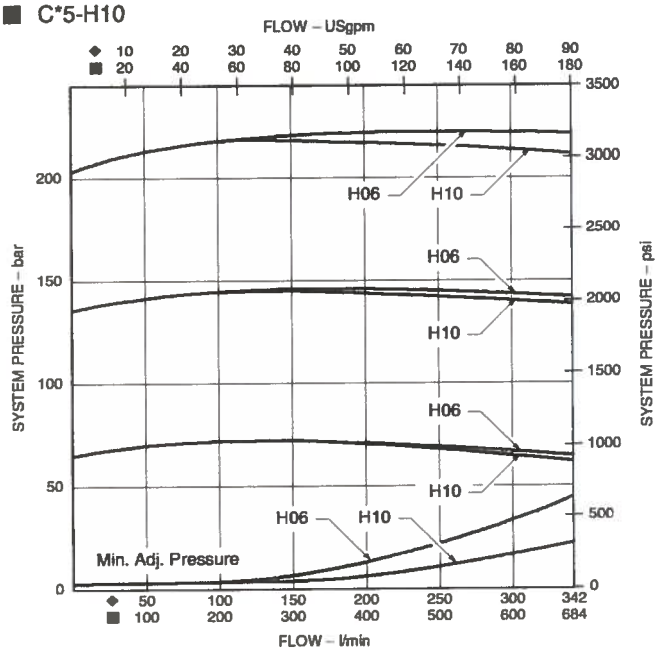
Threaded Port Models

Nominal Override Characteristics

● C*5-03/06
▲ C*5-10

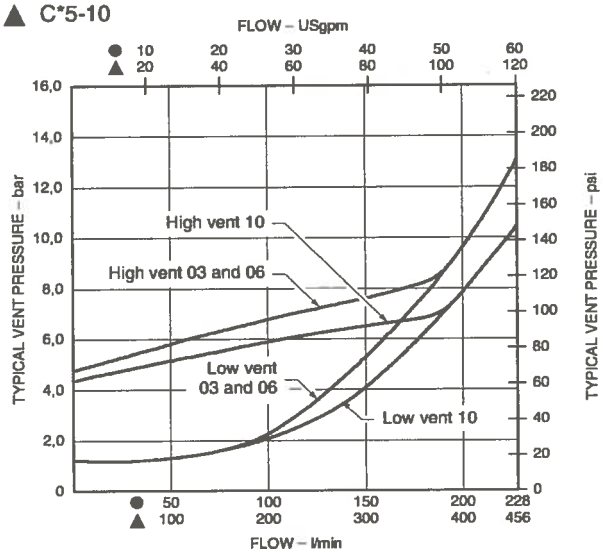


◆ C*5-H06
■ C*5-H10

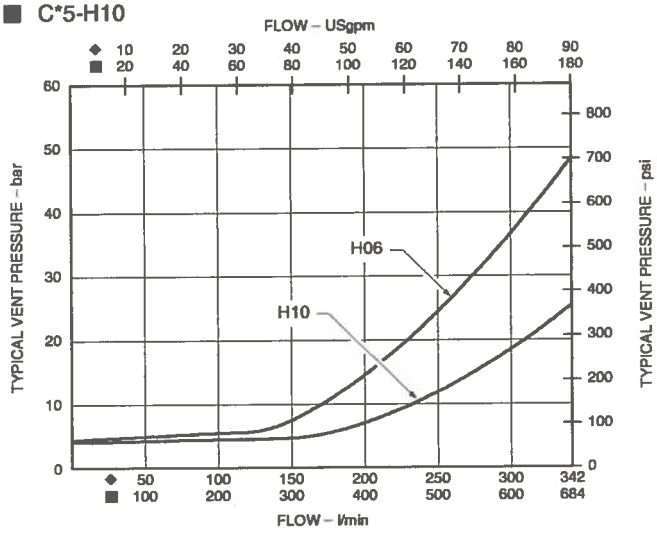


Vent Pressure Versus Flow*

● C*5-03/06
▲ C*5-10


FLOW – USgpm
● 10 20 30 40 50 60
▲ 20 40 60 80 100 120
TYPICAL VENT PRESSURE – bar
TYPICAL VENT PRESSURE – psi
High vent 10
High vent 03 and 06
Low vent
03 and 06
Low vent 10
● 50 100 150 200 228
▲ 100 200 300 400 456
FLOW – l/min

◆ C*5-H06
■ C*5-H10



* Valves supplied with external pilot connections (model designation "0C", "2C", "1A", and "2A") have an integral damping orifice. If these models are vented through their pilot connections, the vent pressures will be approximately 1,7 bar (25 psi) higher than shown.

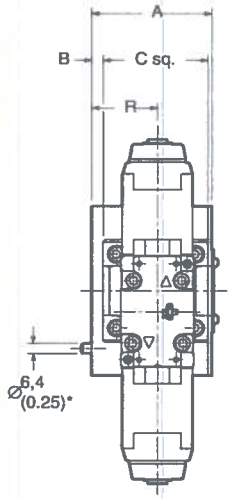
Series C*5-03/06/10 Pilot Operated Relief Valves

Installation Dimensions

mm (inch)

Subplate or Manifold Mounted Models

Double Solenoid Spring Centered Type
CG5-(H) * * * C- * * -M- * - * - 110 Series



Note

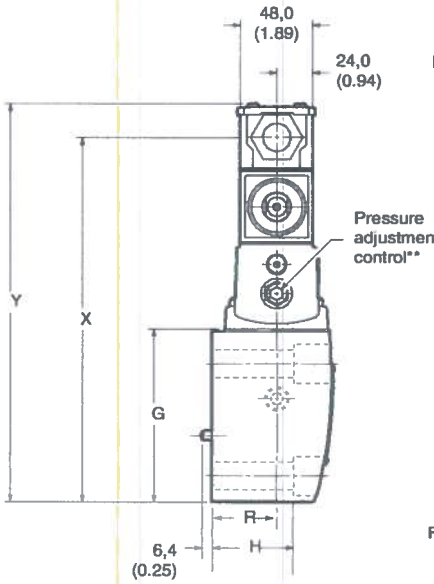
See page 35 for tabulated dimensions.

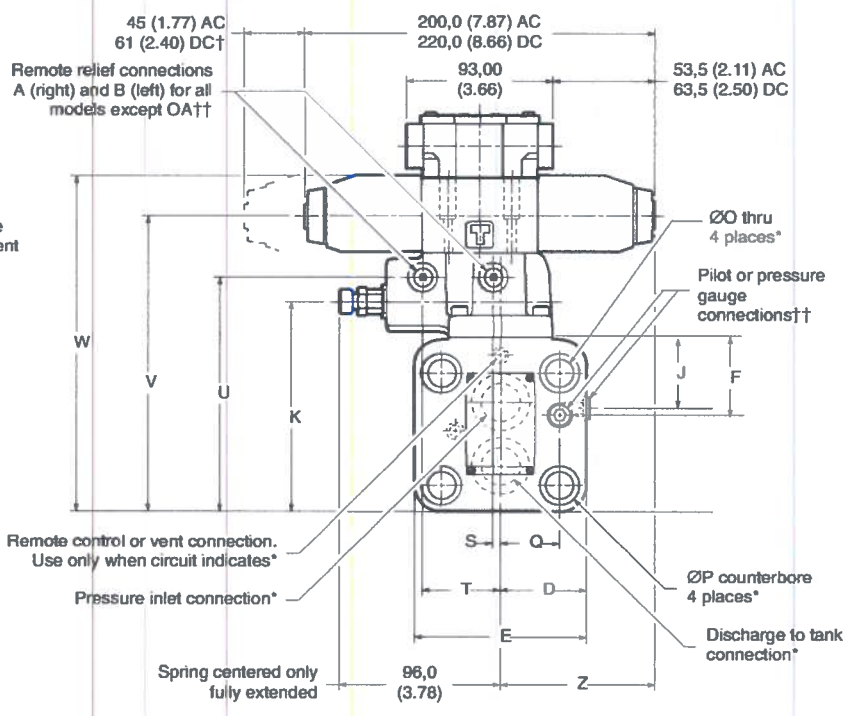
* See mounting subplates for locating dimensions.

** Use 7,92 (0.312) hex key.

† Clearance for removal of solenoid coil.

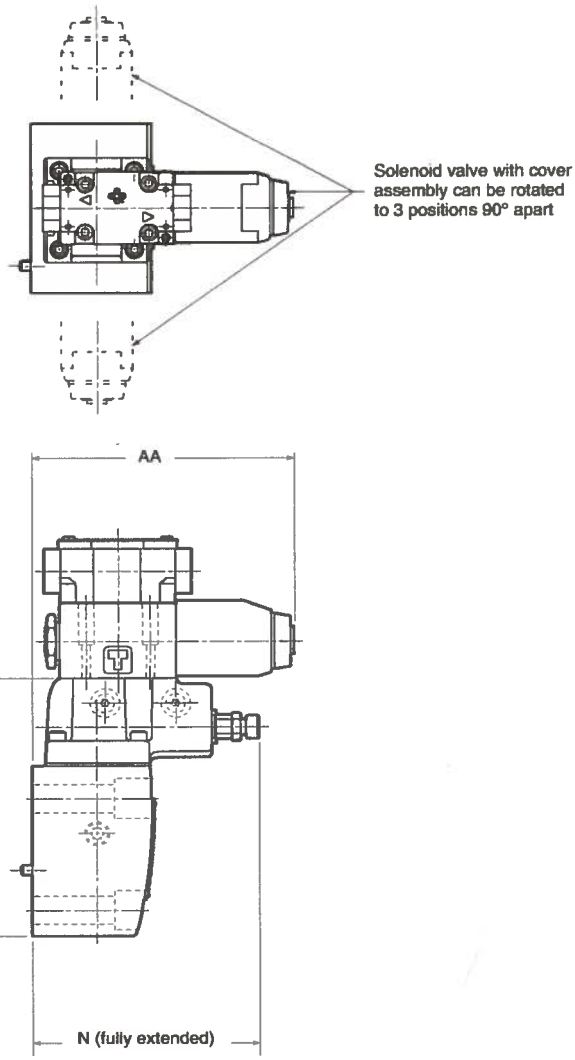
†† .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.





Single Solenoid Spring Offset Type
CG5-(H) * * * A- * * -M- * - * -110 Series

(See page 34 for other details and dimensions)



Model	A	B	C	D	E	F	G	H	J	K	L	M	N	O
CG5-06	71,4 (2.81)	7,9 (0.31)	62,0 (2.44)	53,3 (2.10)	106,4 (4.19)	47,8 (1.88)	107,2 (4.22)	47,8 (1.88)	42,9 (1.69)	131,1 (5.10)	156,5 (6.16)	106,7 (4.20)	134,9 (5.31)	16,6 (0.65)
CG5-(H)10	85,9 (3.38)	2,3 (0.09)	81,0 (3.19)	66,8 (2.63)	133,4 (5.25)	55,6 (2.19)	116,1 (4.57)	63,5 (2.50)	50,8 (2.00)	141,5 (5.57)	168,4 (6.63)	110,7 (4.36)	138,9 (5.47)	19,8 (0.78)

Model	P	Q	R	S	T	U	V	W	X	Y (AC)	Y (DC)	Z (AC)	Z (DC)
CG5-06	24,5 (0.96)	35,1 (1.38)	4,0 (0.16)	46,0 (1.81)	143,8 (5.66)	181,4 (7.14)	207,3 (8.16)	225.3 (8.87)	247,1 (9.73)	89,0 (3.50)	98,8 (3.89)	206,4 (8.12)	234,4 (9.22)
CG5-(H)10	29,3 (1.15)	46,0 (1.81)	5,6 (0.22)	48,5 (1.91)	155,7 (6.13)	193,3 (7.61)	219,2 (8.63)	237,2 (9.34)	259,1 (10.2)	85,0 (3.34)	94,8 (3.73)	54,6 (2.14)	68,5 (2.69)

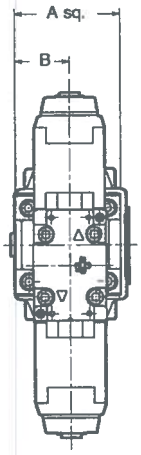
Model	AA	BB
CG5-06	11,4 (0.45)	84,8 (3.34)
CG5-(H)10	17,0 (0.67)	91,2 (3.59)

Series C*5-03/06/10 Pilot Operated Relief Valves

Threaded Port Models

mm (inch)

Double Solenoid Spring Centered Type
CS/T5-(H) * * * C- * * -M- * - * - 100 Series



Note

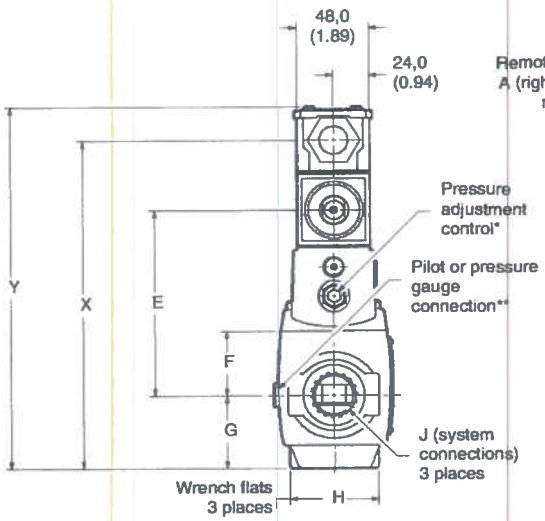
See page 37 for tabulated dimensions.

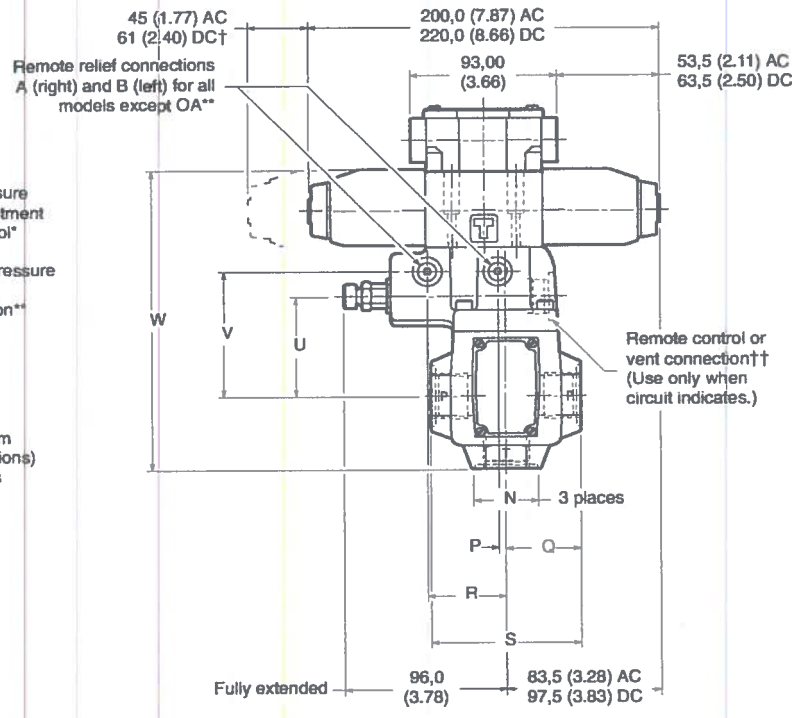
* Use 7,92 (0.312) hex key.

** .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

† Clearance for removal of solenoid coil.

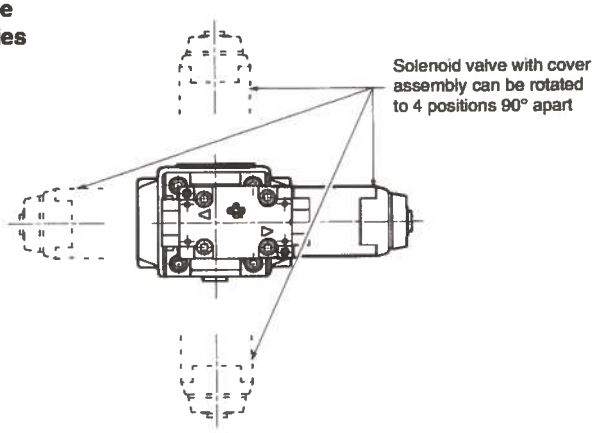
†† .7500-16 UNF-2B thread for 0.500 O.D. tubing.

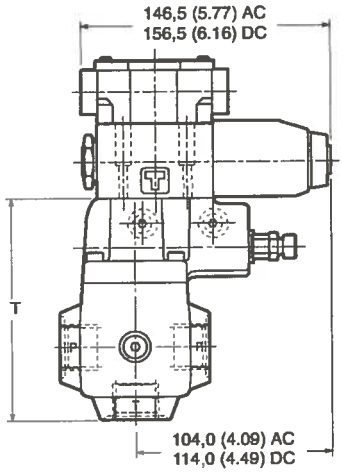




Single Solenoid Spring Offset Type
CS/T5-(H) * * * A- * * -M- * -100 Series

(See page 36 for other details and dimensions)





Model	A	B	C	D	E	F	G	H	J
CS/T5-03	65,0 (2.56)	32,5 (1.28)	229,9 (9.05)	213,4 (8.40)	113,8 (4.48)	39,6 (1.56)	55,6 (2.19)	53,8 (2.12)	CS5-03: .8750-14 UNF-2B thd. for 0.625 O.D. tubing
CS/T5-(H)06/10	83,3 (3.28)	41,7 (1.64)	240,9 (9.48)	224,2 (8.83)	118,6 (4.67)	41,1 (1.62)	62,0 (2.44)	69,9 (2.75)	CS5-(H)06: .062-12 UN-2B thd. for 0.750 O.D. tubing CS5-(H)10: 1.6250-12 UN-2B thd. for 1.250 O.D. tubing CT5-06: $^3/_4$" NPTF thd.■ CTS-10: $1^1/_4$" NPTF thd.■

Model	K	L	M	N	P	Q	R	S	T
CS/T5-03	195,5 (7.70)	76,2 (3.00)	62,0 (2.44)	45,7 (1.80)	4,0 (0.16)	47,8 (1.88)	46,0 (1.81)	95,5 (3.76)	144,5 (5.69)
CS/T5-(H)06/10	206,5 (8.13)	81,0 (3.19)	66,5 (2.62)	62,0 (2.44)	5,59 (0.22)	62,0 (2.44)	48,5 (1.91)	124,0 (4.88)	155,5 (6.12)

■ Not recommended

Series C*19-06/10 Air Operated Relief Valves

Model Code

(F3) C G 19 - (H) 06 2 C (P) F (V) - A10 - 100

1 2 3 4 5 6 7 8 9 10 11 12 13

1 Seals

F3 – For CG19 all internal seals are F3. Interface seals are Buna-N. Add prefix F3 to model for use with mineral oil and fire resistant fluids.
Blank – Omit for CS5 and CT5 (all seals are F3 as standard)

2 Valve Type

C – Relief valve

3 Connections

G – Manifold or subplate mounting (not available in 03 size valve)
T – NPTF thread*

*Not recommended

4 Control Type

19 – Air controlled (pilot operated)

5 High-flow Designation

H – High-flow valve (not available in CT models)
Blank – Omit if not required

6 Valve Size

06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or $^3/_4$" pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or $1^1/_4$" pipe

7 Pilot Spool Function

0, 1, or 2 – Indicates venting condition. See Graphical Symbols on page 46.

8 Pilot Spool Spring Arrangement

A – Spring offset
C – Spring centered
F – Pressurize to center

9 Manual Override

P – Plain override in end cap (single operator models only)
Blank – Omit if not required

10 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)

11 High Vent Spring

V – Optional high vent spring installed (required in high-flow models)
Blank – Omit if not required

12 Pilot Valve Port Orifices

***00** – Solid plug
***03** – 0,30 (0.012)
***06** – 0,60 (0.024)
***08** – 0,80 (0.030)
***10** – 1,00 (0.040)
***13** – 1,30 (0.050)
***15** – 1,50 (0.060)
***20** – 2,00 (0.080)
***23** – 2,30 (0.090)
Blank – Omit if not required

* = P, T, A, or B as required

13 Design Number

Subject to change. Installation dimensions same for designs 100 through 109 (using -60 design DG18V-3 pilot valve).

General Data

C*19-06/10 valves are of balanced piston type construction. These valves are generally used for applications requiring an air controlled adjustable pressure relief or regulating valve to limit the pressure in an oil circuit to the desired maximum.

Pressure Adjustment

Select a pressure range such that excessively high working pressures will not be imposed upon the pump or other equipment.

Adjustment of pressure is accomplished by loosening jam nut and turning adjusting screw. Clockwise rotation increases pressure; counterclockwise rotation decreases pressure.

Application Guidance

High Flow Valve ("H" Model)

The "H" series valves require the use of a high vent spring (C*19-(H)06/10**-*V-**-*-1**).

Installation Data

Tank Connection

The tank connection should be piped directly to tank to minimize back pressure. Any back pressure in the tank line is additive to the valve pressure setting. If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur. Transient pressure peaks in the tank line must not exceed 155 bar (2250 psi).

Note

Surges of oil in a common tank line serving these and other valves can be of sufficient magnitude to cause inadvertent shifting of the pilot spool of the valves. Separate tank lines or a vented manifold with a continuous downward path to tank is necessary.

Mounting

Mounting orientation is unrestricted.

Seals

Threaded Valves:

All seals used in the threaded valves are fluorocarbon as standard and are suitable for use with phosphate ester type fluids or its blends, water glycol, water-in-oil emulsions, and petroleum oil.

Subplate Mounted Valves:

Standard models are furnished with Buna-N seals for the mounting surface and may be used with water glycol, water-in-oil emulsions, and petroleum oil. Internal seals are fluorocarbon. the use of phosphate ester or its blends requires an F3 model. All seals of the F3 models are fluorocarbon, including the mounting surface seals.

Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG19-062C-F-10* valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, $^5/_8$–11 x 2.75")

CGM-06S-20 and CGM-10S-20 subplate installation dimensions are shown in CG-06/10 section. When a subplate is not used, a machined pad (as indicated by subplate shaded area on pages 24 and 25) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

Graphical Symbols

See page 46 for C*19-06/10 graphical symbols.

Ratings

Rated Pressure (Maximum)	210 bar (3000 psi)
Rated Capacity (Maximum) CG/T19-06 CG/T19-H06 CG/T19-10 CG/T19-H10	 227 l/min (60 USgpm) 340 l/min (90 USgpm) 454 l/min. (120 USgpm) 680 l/min (180 USgpm)
Maximum Air Pilot Pressure	10 bar (150 psi)
Minimum Air Pilot Pressure	1,0 bar (15.0 psi)

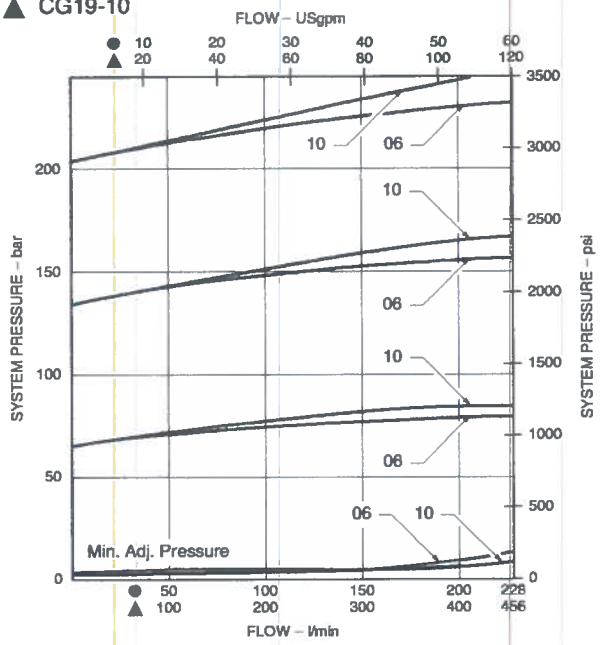
Series C*19-06/10 Air Operated Relief Valves

Performance Curves

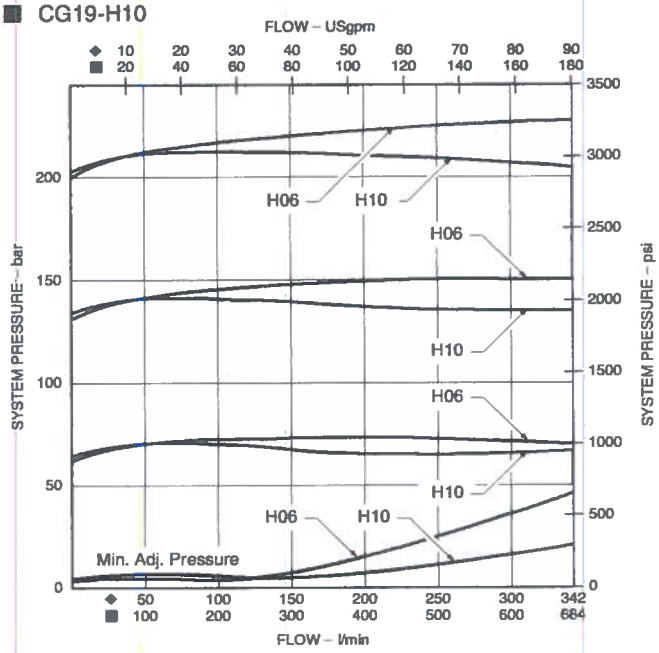
Subplate or Manifold Mounted Models

Nominal Override Characteristics

● CG19-06
▲ CG19-10

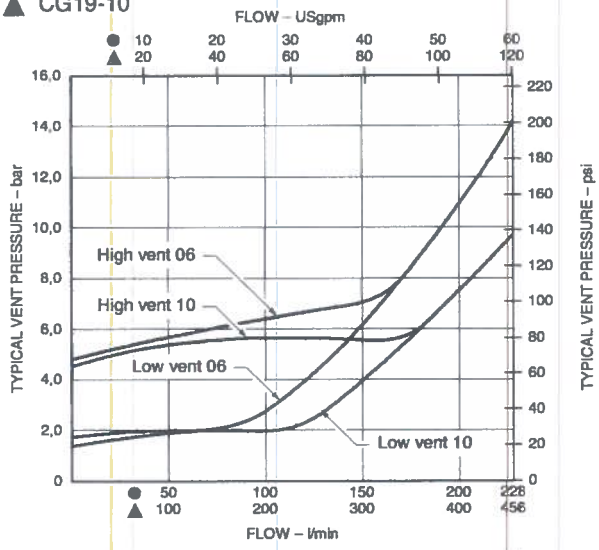


◆ CG19-H06
■ CG19-H10

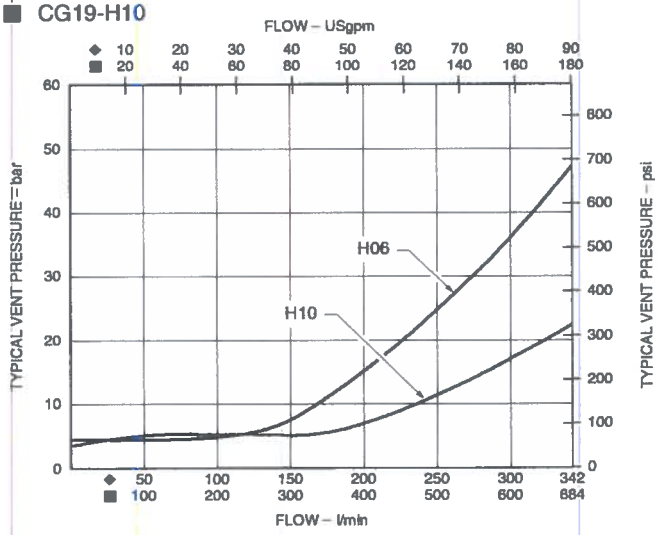


Vent Pressure Versus Flow*

● CG19-06
▲ CG19-10



◆ CG19-H06
■ CG19-H10

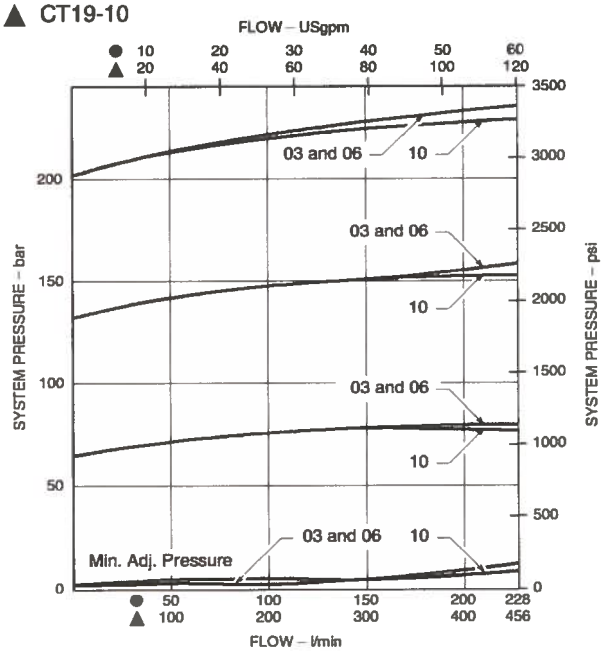


* Valves supplied with external pilot connections (model designation "0C", "2C", "1A", and "2A") have an integral damping orifice. If these models are vented through their pilot connections, the vent pressures will be approximately 1,7 bar (25 psi) higher than shown.

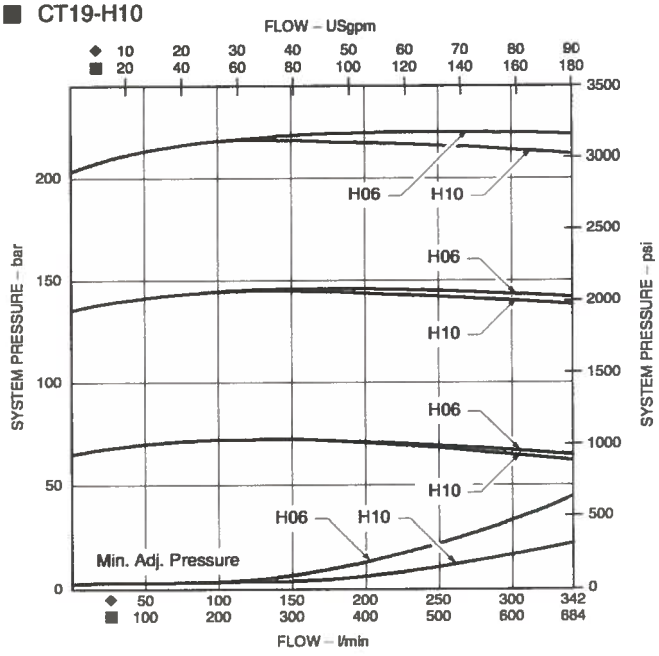
Threaded Port Models

Nominal Override Characteristics

● CT19-06
▲ CT19-10

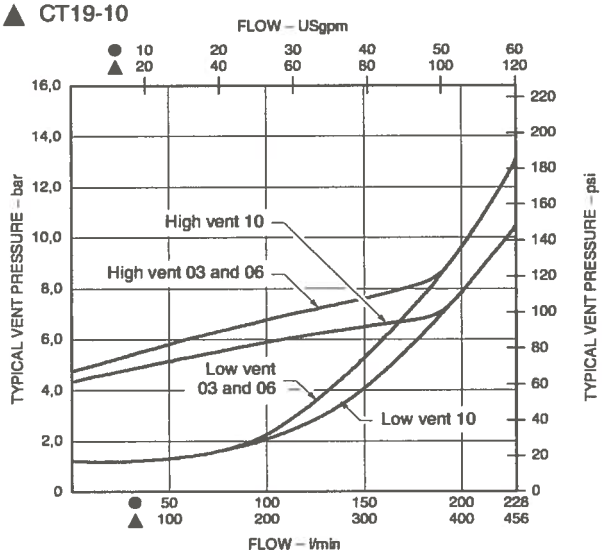


◆ CT19-H06
■ CT19-H10

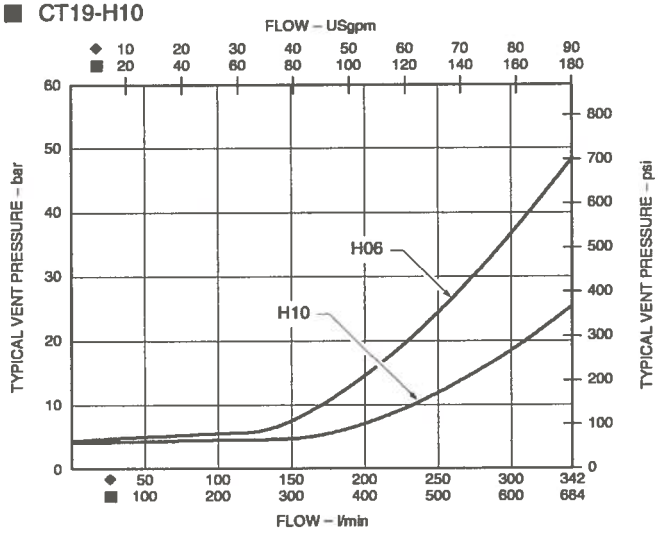


Vent Pressure Versus Flow*

● CT19-06
▲ CT19-10



◆ CT19-H06
■ CT19-H10



* Valves supplied with external pilot connections (model designation "0C", "2C", "1A", and "2A") have an integral damping orifice. If these models are vented through their pilot connections, the vent pressures will be approximately 1,7 bar (25 psi) higher than shown.

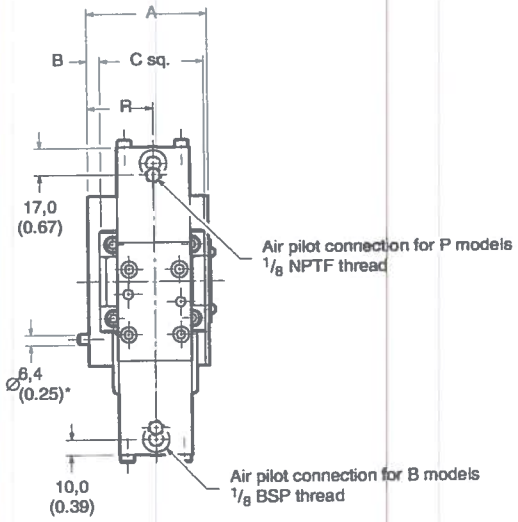
Series C*19-06/10 Air Operated Relief Valves

Installation Dimensions

mm (inch)

Subplate or Manifold Mounted Models

Double Operator Spring Centered Type
CG19-(H) * * * C- * * - * - * - 100 Series



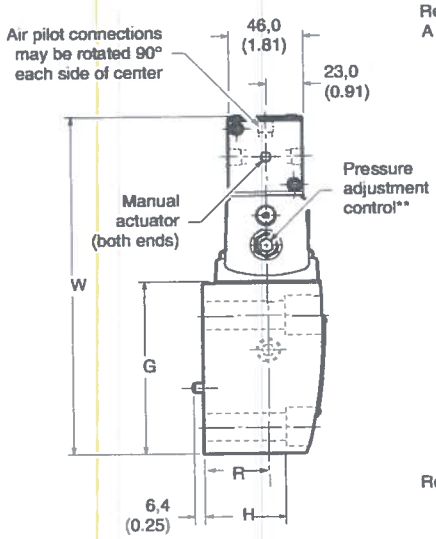
Note

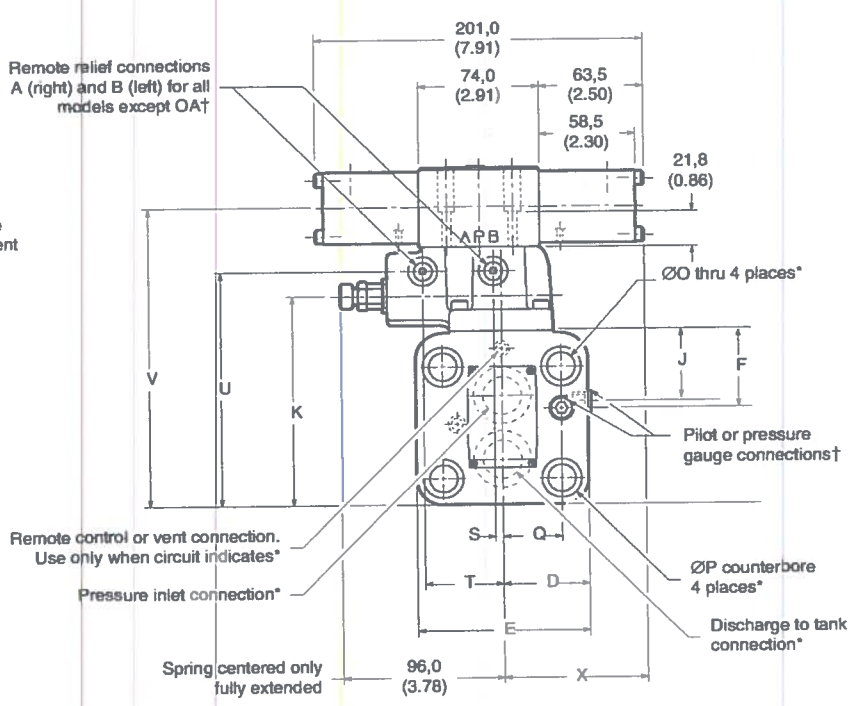
See page 43 for tabulated dimensions.

* See mounting subplates for locating dimensions.

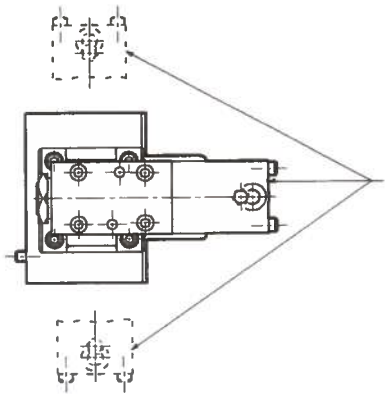
** Use 7,92 (0.312) hex key.

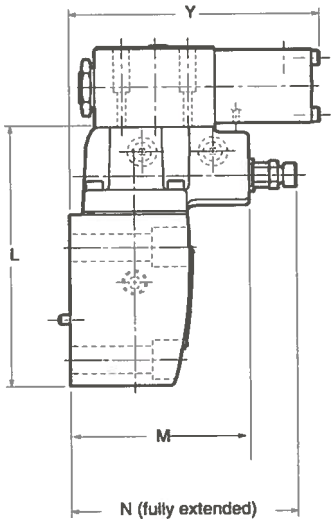
† .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

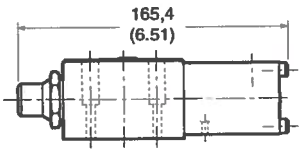




Single Operator Spring Offset Type
CG19-(H) * * * A- * * - * - * - 100 Series
(See page 42 for other details and dimensions)







Manual Override Actuator
(for single operator models)
Typical Model CG19-062AP * - 100
Manual actuator applicable if pilot is rotated 90° from standard position.

Model	A	B	C	D	E	F	G	H	J	K	L	M
CG19-06	71,4 (2.81)	7,9 (0.31)	62,0 (2.44)	53,3 (2.10)	106,4 (4.19)	47,8 (1.88)	107,2 (4.22)	63,5 (2.50)	50,8 (2.00)	129,5 (5.10)	156,5 (6.16)	100,8 (3.97)
CG19-(H)10	85,9 (3.38)	2,3 (0.09)	81,0 (3.19)	66,8 (1.69)	133,4 (8.59)	55,6 (7.59)	116,1 (4.57)	63,5 (2.50)	50,8 (2.00)	141,5 (5.57)	164,6 (0.22)	104,7 (1.81)

Model	N	O	P	Q	R	S	T	U	V	W	X	Y
CG19-06	159,5 (6.28)	16,6 (0.65)	24,5 (0.96)	35,1 (1.38)	38,9 (1.53)	4,0 (0.16)	46,0 (1.81)	143,8 (5.66)	180,8 (7.12)	206,2 (8.12)	85,1 (3.35)	153,4 (6.04)
CG19-(H)10	163,6 (1.91)	19,8 (0.78)	29,3 (1.15)	46,0 (1.81)	42,9 (1.69)	4,0 (0.16)	48,5 (1.91)	155,7 (6.13)	192,8 (7.59)	218,2 (8.59)	85,0 (3.35)	159,0 (6.26)

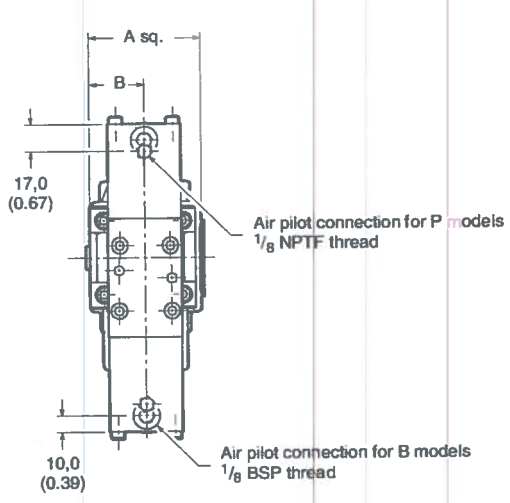
Series C*19-06/10 Air Operated Relief Valves

Threaded Port Models

mm (inch)

Double Operator Spring Centered Type

CT19-*C-**-M-*-*-100 Series**



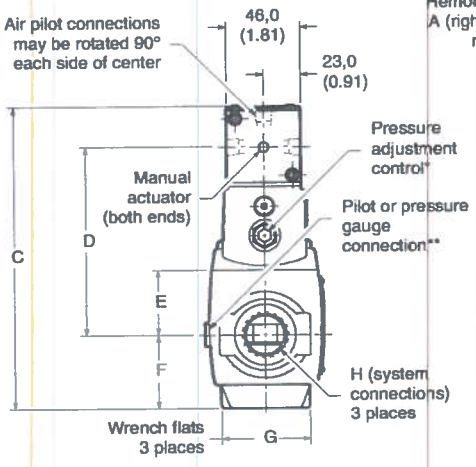
Note

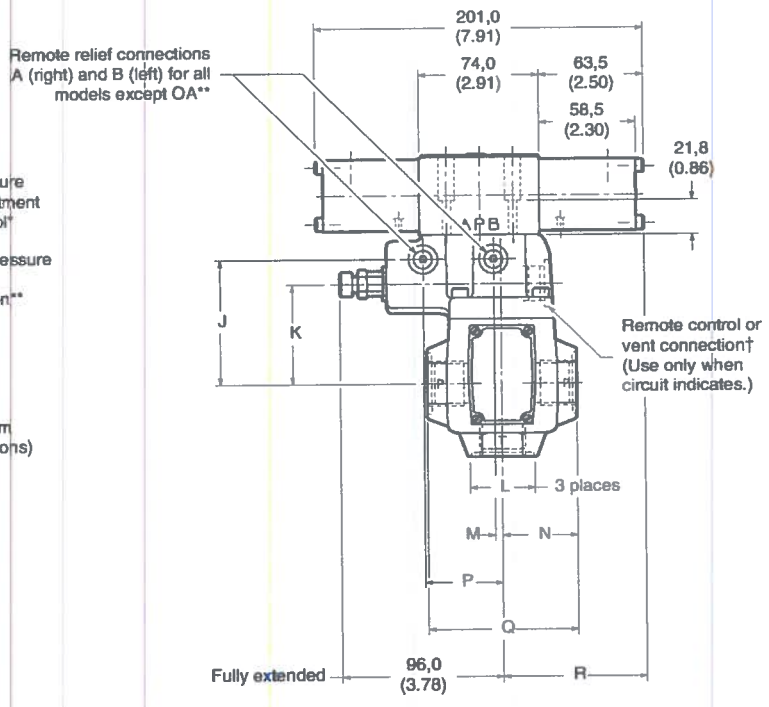
See page 45 for tabulated dimensions.

* Use 7,92 (0.312) hex key.

** .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

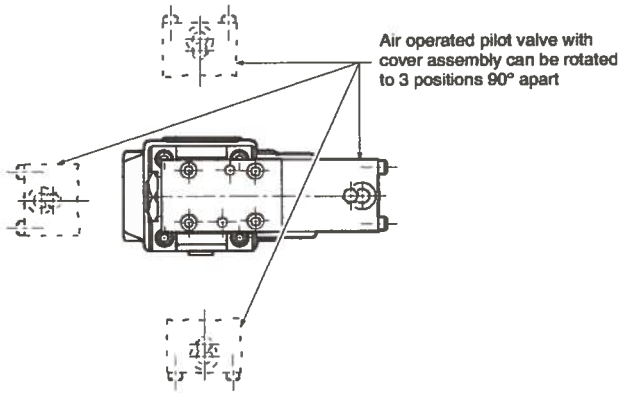
† .7500-16 UNF-2B thread for 0.500 O.D. tubing.

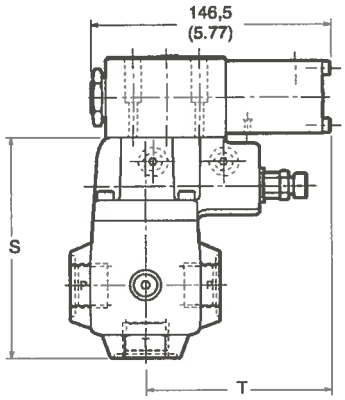


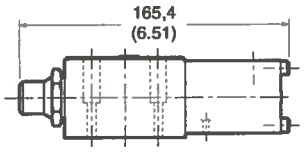


Single Operator Spring Offset Type
CT19- * * * A- * * -M- * - * -100 Series

(See page 44 for other details and dimensions)







Manual Override Actuator
(for single operator models)
Typical Model CT19-062AP * - 100

Model	A	B	C	D	E	F	G	H	J
CT19-06	65,0 (2.56)	32,5 (1.28)	194,3 (7.65)	113,3 (4.46)	39,6 (1.56)	55,6 (2.19)	53,8 (2.12)	3/4" NPTF thd.■	76,2 (3.00)
CT19-(H)10	83,3 (3.28)	41,7 (1.64)	205,3 (8.08)	118,1 (4.65)	41,1 (1.62)	62,0 (2.44)	69,9 (2.75)	1 1/4" NPTF thd.■	81,0 (3.19)

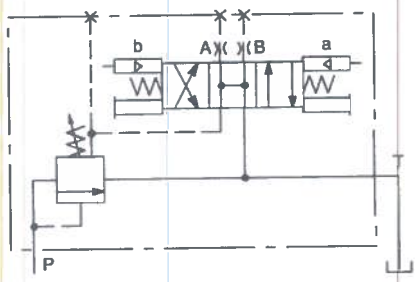
Model	K	L	M	N	P	Q	R	S	T
CT19-06	62,0 (2.44)	45,7 (1.80)	4,0 (0.16)	47,8 (1.88)	46,0 (1.81)	95,5 (3.76)	79,4 (3.12)	144,5 (5.69)	106,0 (4.17)
CT19-(H)10	66,5 (2.62)	62,0 (2.44)	5,59 (0.22)	62,0 (2.44)	48,5 (1.91)	124,0 (4.88)	77,7 (3.06)	155,5 (6.12)	108,0 (4.25)

■ Not recommended

Series C*19-06/10 Air Operated Relief Valves

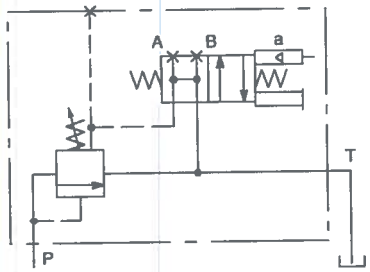
Graphical Symbols

Model C*19-(H)**0C (DG18V-3-0C Pilot)



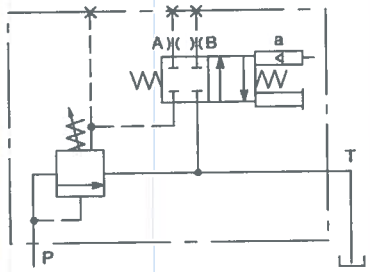
When operator "A" is pressurized, control is at connection "A". When operator "B" is pressurized, control is at connection "B". When both operators are de-pressurized, valve is vented.

Model C*19-(H)**0A (DG18V-3-0BL Pilot)



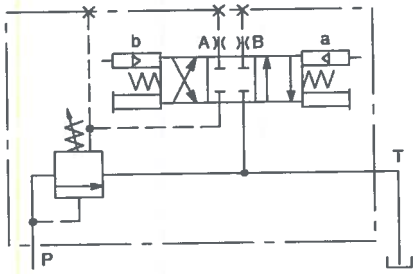
When operator "A" is pressurized, control is by integral adjustment. When operator "A" is de-pressurized, valve is vented.

Model C*19-(H)**2A (DG18V-3-2BL Pilot)



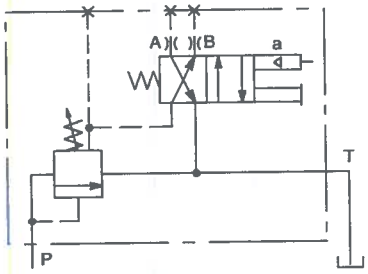
When operator "A" is pressurized, control is at connection "A". When operator "A" is de-pressurized, control is by integral adjustment.

Model C*19-(H)**2C (DG18V-3-2C Pilot)



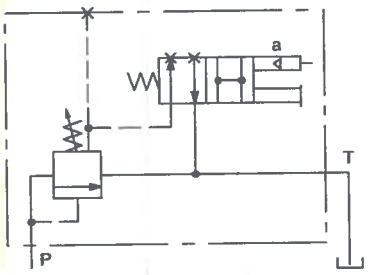
When operator "A" is pressurized, control is at connection "A". When operator "B" is pressurized, control is at connection "B". When both operators are de-pressurized, control is by integral adjustment.

Model C*19-(H)**1A (DG18V-3-2AL Pilot)



When operator "A" is pressurized, control is at connection "A". When operator "A" is de-pressurized, control is at connection "B".

Model C*19-(H)**0F (DG18V-3-0FL Pilot)



When operator "A" is pressurized, valve is vented. When operator "A" is de-pressurized, control is by integral adjustment.

Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

Model Code

(F3) C G - (H) 10 - C (E) F (V) - (PA3) - DG (L) (W) - 8C - (230AC) - 20

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 Seals

F3 – For mineral oil and fire resistant fluids. Mounting face seals of CG model relief and all pilot valves have standard Buna-N seals unless specified as F3.
Blank – Omit for standard models

2 Valve Type

C – Relief valve

3 Connections

G – Manifold or subplate mounting
S – SAE straight thread
T – NPTF thread*

*Not recommended

4 High-flow Designation

H – High-flow valve (not available in CT models)
Blank – Omit if not required

5 Valve Size

06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or $^3/_4$" pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or $1^1/_4$" pipe (not available in CS or CT models)

6 Head No. 1 Pressure range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)
E – Vent (tri-pressure models only)

7 Head No. 2 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)
E – Vent (tri-pressure models only)
Blank – Omit for bi-pressure models

8 Head No. 3 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)
E – Vent (tri-pressure models only)

9 High Vent Spring

V – Optional high vent spring installed (required in high-flow models)
Blank – Omit if not required

10 Electrical Connections

PA3 – 3-pin receptacle (single solenoid models only)
PA5 – 5-pin receptacle
PB – "Insta-Plug" with male and female connectors
S – Spool indicator switch (bi-pressure models only). Also available with PA3 and PA5 models.
Blank – Omit if not required

11 Pilot Valve (DG4S4-01)

DG – Solenoid operated, sliding spool, four-way directional valve

12 Solenoid Indicator Light(s)

L – Lights available for use with 100V AC through 125V AC solenoids only
Blank – Omit if not required

13 Housing

W – $^1/_2$" NPT thread wiring housing (required for PA3 and PA5 models)
Blank – Omit if not required

14 Pilot Spool Function and Spring Arrangement

0A – Spring offset open center spool (bi-pressure models only)
8C – Spring centered tandem center spool with open center crossover (tri-pressure models only)

WARNING

Tandem center spool (8) must be used only with spring centered pilot valve (C). Open center spool (0) must be used only with spring offset pilot valve (A). Use of any other spools could be hazardous.

15 Solenoid Coil Voltage Rating

230AC – 230V AC 60 Hz coils
460AC – 460V AC 60 Hz coils
115AC-50/60 – 115V AC 50/60 Hz coils
6DC – 6V DC coils
12DC – 12V DC coils
24DC – 24V DC coils
Blank – Omit for standard 115V AC 60 Hz coils

16 Design Number

Subject to change. Installation dimensions same for designs 20 through 29 (using -50 design DG4S4-01 pilot valve).

Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

General Data

The tri-pressure relief valve is a pressure control unit which can be used to electrically select any one of three preset pressures, or two pressures and vent. The bi-pressure relief valve can be used to electrically select either of two preset pressures, or one pressure and vent.

The main stage is a balanced piston type relief valve, and the intermediate stages are of the poppet spring type. The pilot stage uses a standard DG4S4-01 (NFPA-D05) valve (see Vickers publication 671 for more details).

Pressure Adjustment

Any head in the intermediate stage can contain a B, C, or F spring. The pressure ranges of these springs are shown in the following table.

Spring	Pressure Range bar (psi)
B	8,5 to 70 (125 to 1000)
C	35 to140 (500 to 2000)
F	100 to 210 (1500 to 3000)

The minimum pressure as indicated for the "B" spring is a function of flow and is shown on the corresponding Nominal Override Characteristics curves.

If there is an "E" in the model code, the corresponding control head contains no spring. When that head is put into operation, the system is vented. The vent pressure is shown on the Vent Pressure vs. Flow curves.

Pressure for each head can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Application Guidance

High Flow Valve ("H" Model)

"H" series valves require the use of a high vent spring (CS-H06-BC**V**-DG or CG-H10-FCB**V**-DG).

Installation Data

Tank Connection

The tank connection should be piped directly to tank to minimize back pressure. Any back pressure in the tank line is additive to the valve pressure setting. If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur.

Mounting

Inlet and outlet pressure connections (on straight or NPTF thread models) may be used interchangeably when the valve is mounted in the pressure line, or the valve may be teed off the pressure line with one of the pressure connections plugged. The tank connection should be piped directly to tank to minimize back pressure.

Electrical Information

Solenoids

Solenoids on models listed are for 115V AC 60 Hz service. Solenoids for other voltages and frequencies are available. Specify in the model code if service other than 115V AC 60 Hz is desired.

Note

Solenoids are designed to function continuously at ± 10% rated voltage.

All solenoid coil wire insulation is Class "F". Standard solenoid coil lead wire has Class "A" insulation. "F3" solenoid coil lead wire is Class "F".

Solenoids "a" and "b" are identified on the unit by a diagram plate on the side of the pilot valve.

Solenoid Energizing

On tri-pressure models (C*-06/10-****-**DG*-**8C**-*-*-2*), energizing solenoid "a" causes pilot head No. 3 to control the pressure. Energizing solenoid "b" causes pilot head No. 1 to control the pressure. With both solenoids de-energized, pilot head No. 2 will control the pressure. Solenoids must be kept energized to maintain a desired action.

On bi-pressure models (C*-06/10-***-**DG*-**0A**-*-*-2*), de-energizing the solenoid causes pilot head No. 1 to control the pressure. Energizing the solenoid causes pilot head No. 3 to control the pressure. The solenoid must be kept energized to maintain the desired action.

WARNING

DG pilot valve must conform to relief valve type being used. If relief valve is tri-pressure, pilot stage must be DG4S4-01**8C**- *-5*. This valve contains type "8" tandem center open center crossover spool. If relief valve is bi-pressure, pilot stage must be DG4S4-01**0A**- *-5*. This valve contains type "0" open center spool. Use of incorrect spools could be hazardous.

Note

Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation. The valve should be cycled periodically to prevent this.

Spring centered and spring offset pilot valves are spring positioned unless the solenoid is energized continuously.

Additional Information

Eaton publication 671 contains additional information and dimensions on the pilot portion of the C*-06/10-DG, including solenoids and connections, insta-plug connections, and NFPA electrical connectors.

Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG-06-BCF-DG-8C-2* valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, $^5/_8$-11 x 2.75")

CGM-06S-20 and CGM-10S-20 subplate installation dimensions are shown in CG-06/10 section. When a subplate is not used, a machined pad (as indicated by subplate shaded area on pages 24 and 25) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

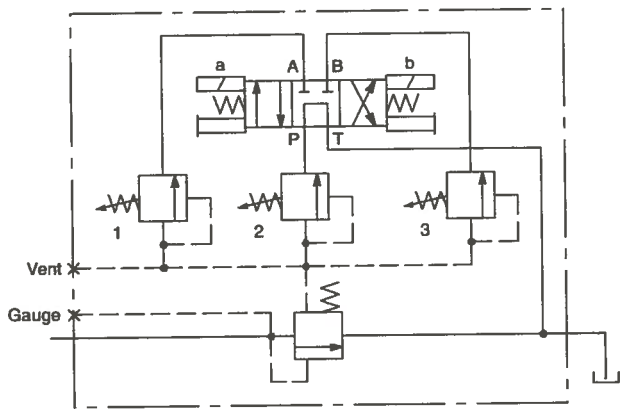
Solenoid Voltage Rating	Inrush amps (R.M.S.)	Holding amps	Holding watts
115V AC 60 Hz	5.1	0.61	—
230V AC 60 Hz	2.55	0.32	—
460V AC 60 Hz	1.27	0.16	—
115V AC 50/60 Hz	50 Hz: 3.25 60 Hz: 4.97	50 Hz: 0.56 60 Hz: 0.59	—
6V DC	—	4.0	24
12V DC	—	2.0	24
24V DC	—	1.0	24

Ratings

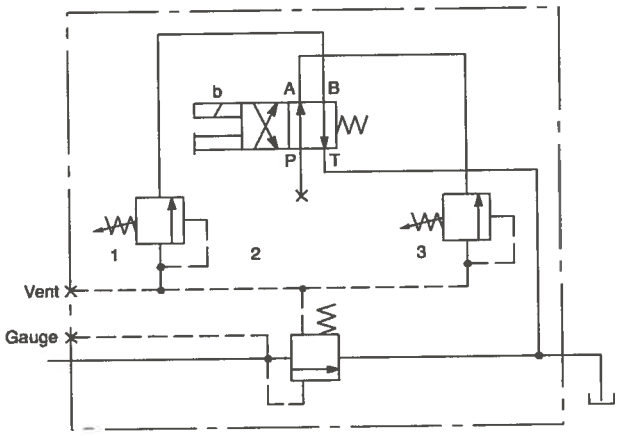
Rated Pressure (Maximum)	210 bar (3000 psi)	
Rated Capacity (Maximum)	**Standard**	**"H"**
C*-06 and CG/S-H06	227 l/min (60 USgpm)	340 l/min (90 USgpm)
CG-10 and CG-H10	454 l/min (120 USgpm)	680 l/min (180 USgpm)

Graphical Symbols

Tri-pressure Spring Centered Valve, 3-position
C*--***-DG-8C-2***



Bi-pressure Spring Offset Valve, 2-position
C*--**-DG-0A-2***



Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

Graphical Symbols (continued)

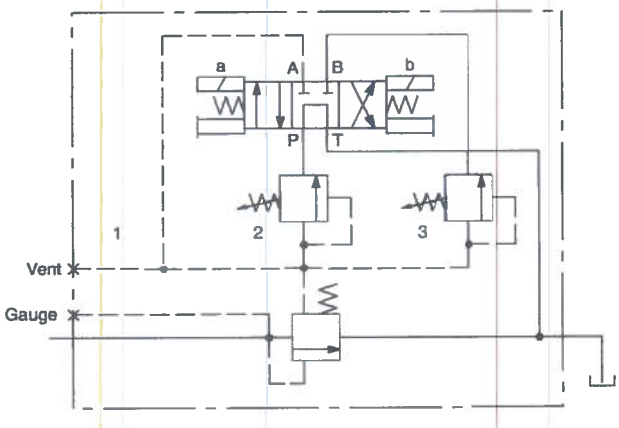
Internal Vent Tri-pressure Models

On internal vent models, one control head is open and is identified by the letter "E" in the model code. Venting can be set so as to be selected by solenoid "a" or solenoid "b". When control head No. 2 is open, venting takes place when both solenoids are de-energized.

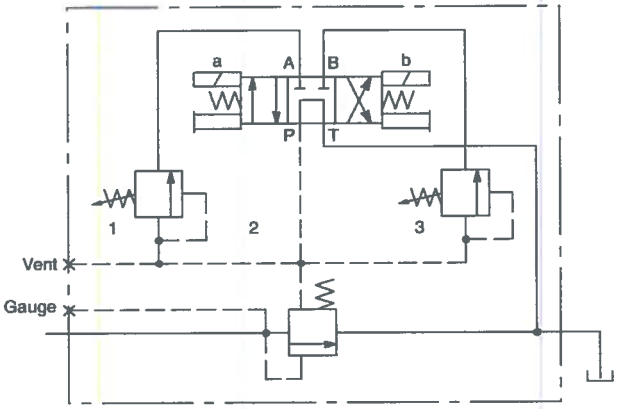
Note

Only the tri-pressure models are recommended for internal venting. If a single solenoid pilot valve is required to select one pressure or vent, consider using a C*5-06/10 model (see page 28).

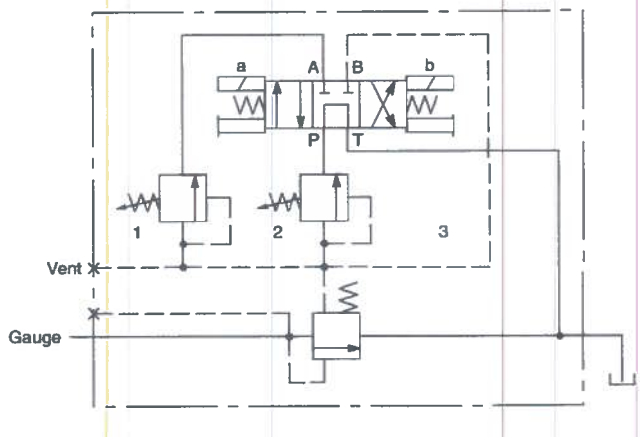
Tri-pressure Spring Centered Valve, 3-position
C*--E**-DG-8C-2***



Tri-pressure Spring Centered Valve, 3-position
C*--*E*-DG-8C-2***



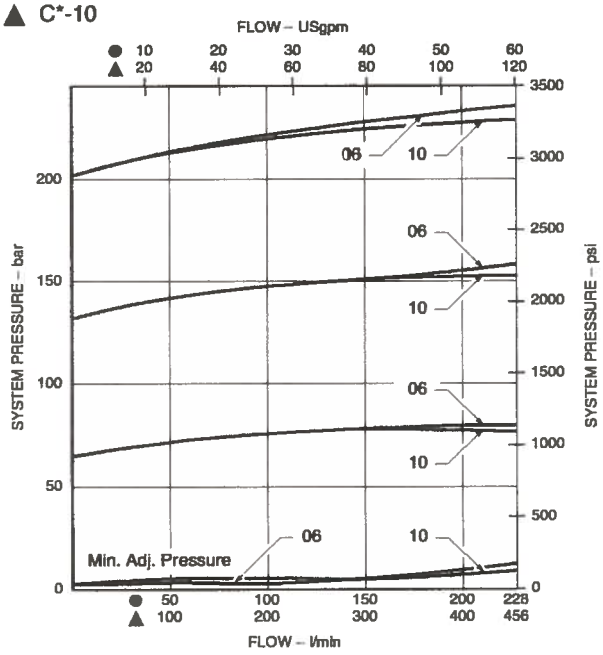
Tri-pressure Spring Centered Valve, 3-position
C*--**E-DG-8C-2***



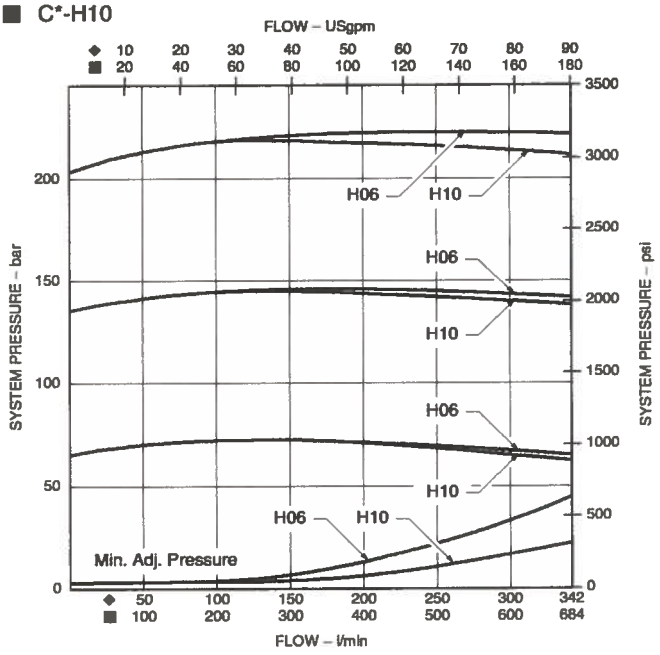
Performance Curves

Nominal Override Characteristics

● C*-06
▲ C*-10

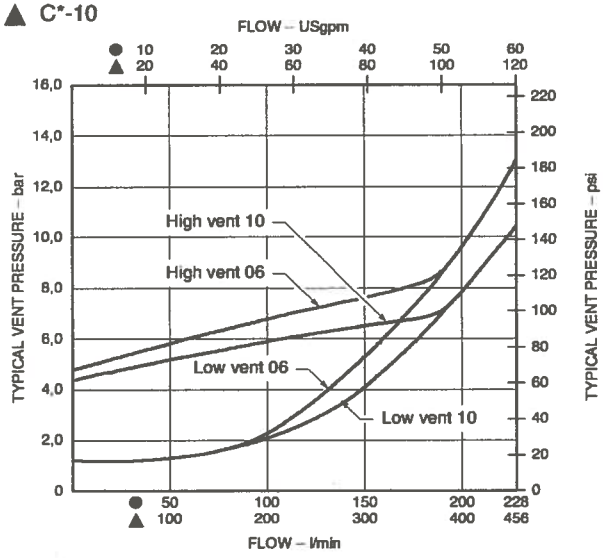

FLOW – USgpm
● 10 20 30 40 50 60
▲ 20 40 60 80 100 120
SYSTEM PRESSURE – bar
SYSTEM PRESSURE – psi
06
10
Min. Adj. Pressure
● 50 100 150 200 228
▲ 100 200 300 400 456
FLOW – l/min

◆ C*-H06
■ C*-H10

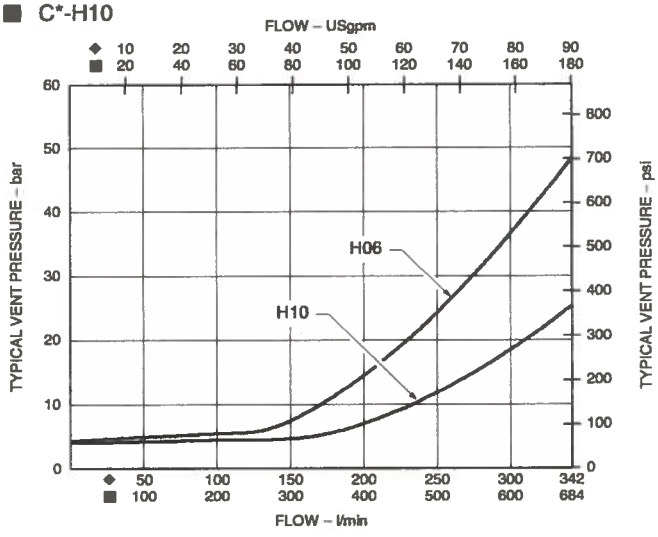


Vent Pressure Versus Flow

● C*-06
▲ C*-10


FLOW – USgpm
● 10 20 30 40 50 60
▲ 20 40 60 80 100 120
TYPICAL VENT PRESSURE – bar
TYPICAL VENT PRESSURE – psi
High vent 10
High vent 06
Low vent 06
Low vent 10
● 50 100 150 200 228
▲ 100 200 300 400 456
FLOW – l/min

◆ C*-H06
■ C*-H10



Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

Installation Dimensions

mm (inch)

Subplate or Manifold Mounted Models

Bi-pressure
CG-(H)-**-***DG*-0A-*-2***
and Tri-pressure
CG-(H)-***-***DG*-8C-*-2***

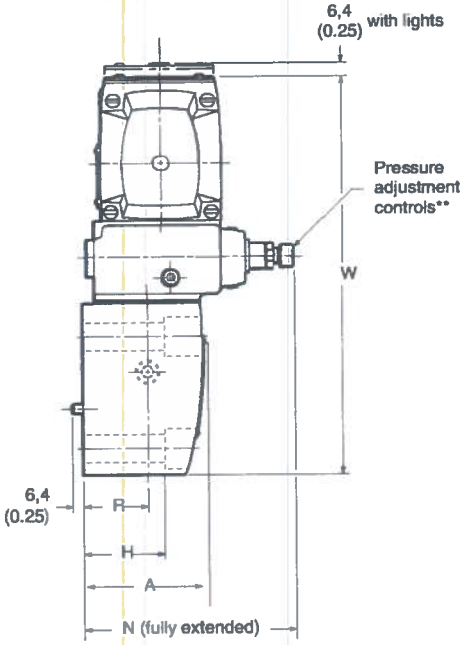
Note

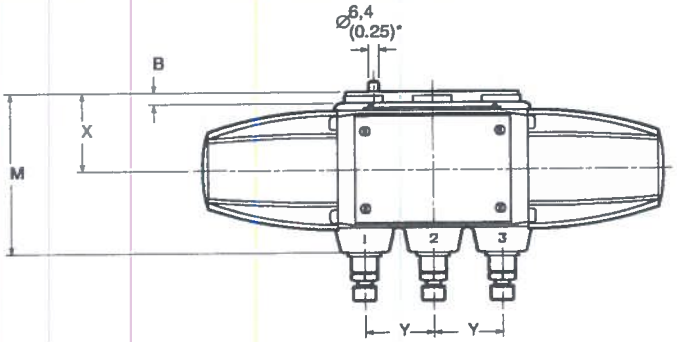
* See mounting subplates for locating dimensions.

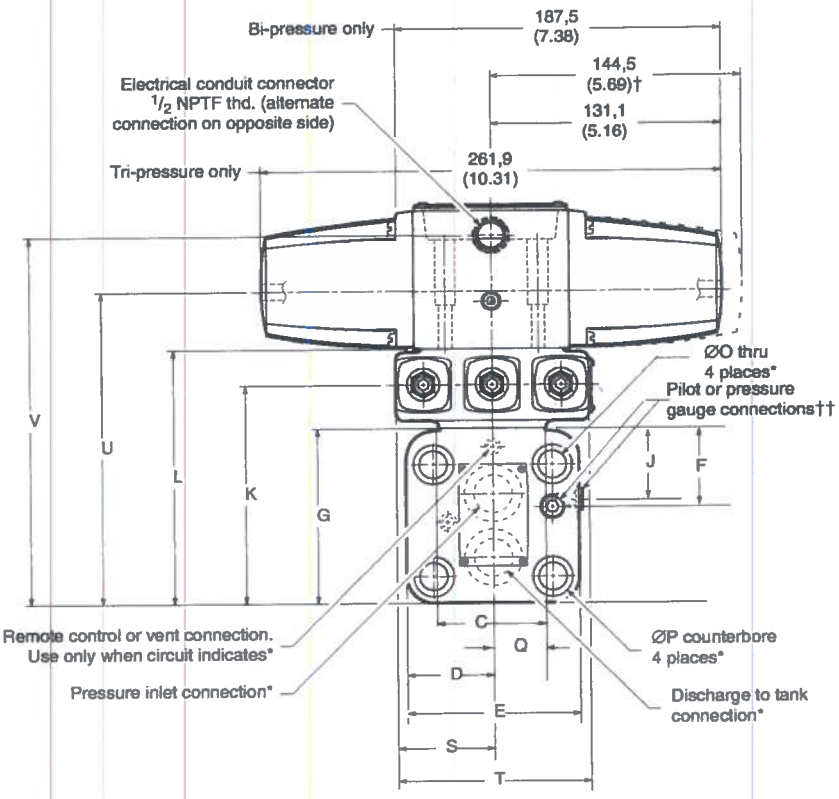
** Use 7,92 (0.312) hex key.

† Clearance for removal of solenoid coil.

†† .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.







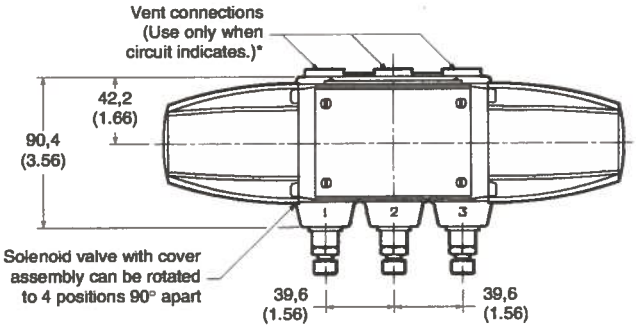
Model	A	B	C	D	E	F	G	H	J	K	L	M	N
CG-(H)06-DG	71,4 (2.81)	7,9 (0.31)	62,0 (2.44)	53,3 (2.10)	106,4 (4.19)	47,8 (1.88)	107,2 (4.22)	47,8 (1.88)	42,9 (1.69)	134,1 (5.28)	155,7 (6.13)	96,8 (3.81)	159,5 (6.28)
CG-(H)10-DG	85,9 (2.81)	2,3 (0.31)	81,0 (2.44)	66,8 (2.63)	133,4 (5.25)	55,6 (2.19)	116,1 (4.57)	63,5 (2.50)	50,8 (2.00)	145,5 (5.73)	166,9 (6.57)	103,1 (4.06)	133,9 (5.27)

Model	O	P	Q	R	S	T	U	V	W	X	Y
CG-(H)06-DG	16,6 (0.65)	24,5 (0.96)	35,1 (1.38)	35,9 (1.53)	55,6 (2.19)	111,3 (4.38)	191,8 (7.55)	225,6 (8.88)	242,8 (9.56)	48,5 (1.91)	39,6 (1.56)
CG-(H)10-DG	19,8 (0.78)	29,3 (1.15)	46,0 (1.81)	42,9 (1.69)	62,7 (2.47)	125,5 (4.94)	202,9 (7.99)	236,7 (9.32)	254,0 (10.00)	60,5 (2.38)	46,7 (1.84)

Threaded Port Models

mm (inch)

Bi-pressure
CS/T-(H)06--***DG*-0A-*-2***
and Tri-pressure
CS/T-(H)06-*-***DG*-8C-*-2***



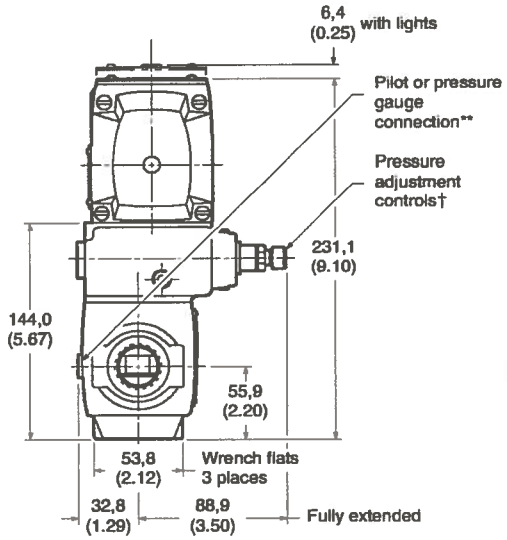
Note

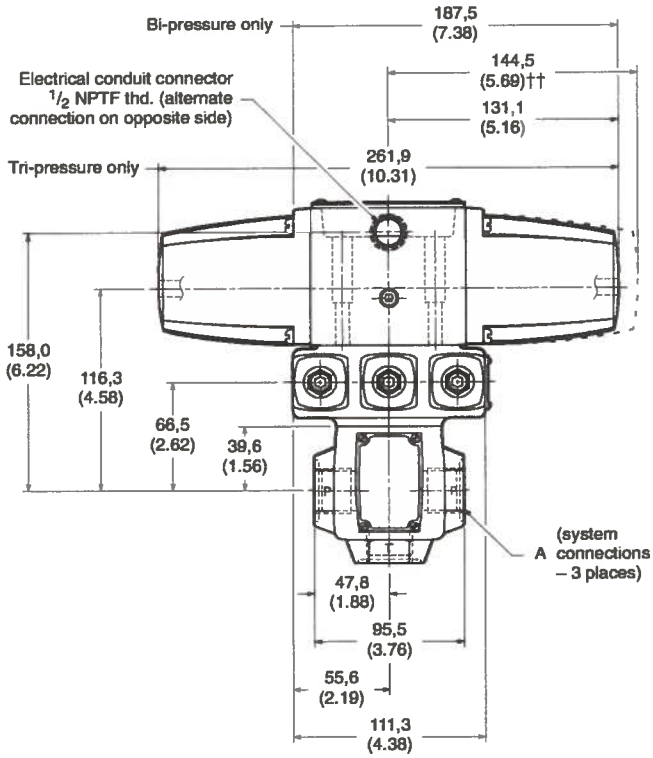
* .7500-16 UNF-2B thread for 0.500 O.D. tubing.

** .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

† Use 7,92 (0.312) hex key.

†† Clearance for removal of solenoid coil.





Model	A
CS-(H)06-DG	1.0625-12 UN-2B thd. for 0.750 O.D. tubing
CT-(H)06-DG	3/4" NPTF thd.■

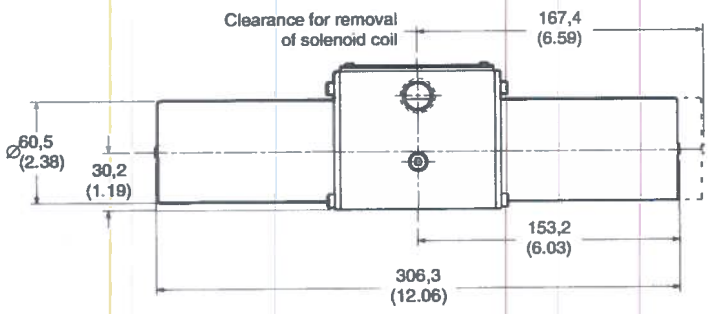
■ Not recommended

Series C*-06/10-DG Bi/Tri-Pressure Relief Valves

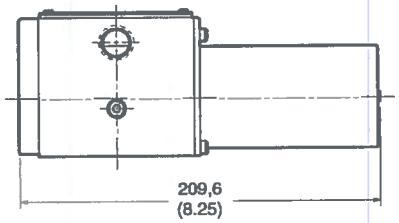
DC Solenoid Models

mm (inch)

Double Solenoid Spring Centered Tri-pressure
C * -(H)06 - * * * - * * * DG-8C-24DC-20



Single Solenoid Spring Offset Bi-pressure
C * -(H)06 - * * - * * * DG-0A-24DC-20



Monitor Switch Models

mm (inch)

Single Solenoid Spring Offset Bi-pressure (only) with Monitor Switch C * -10- * * -SDG-0A-20

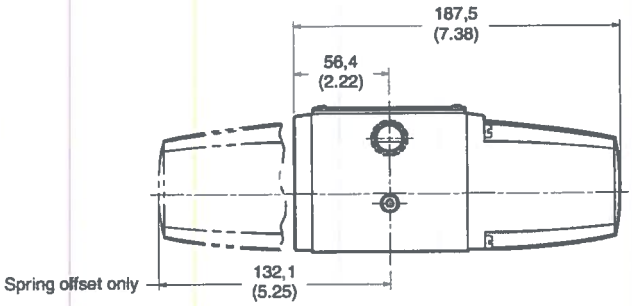
When the solenoid is de-energized, the spool is returned to the offset position.

Internal Monitor Switch

This switch permits electrical interlocking of various hydraulic controlled motions without resorting to external mechanical contrivances. The switch monitors valve spool position and may be wired into the control circuit.

The monitor switch is a plunger type with panel mounting and uses a single pole, double throw contact arrangement. "A" is normally closed, and "B" is normally open.

The housing of the monitor switch does not provide for manual override operation.



Electrical Ratings

Volts	AC amps	DC amps
28	20	10
125	20	0.5
250	20	0.2
480	20	–
600	5	–

Series C*-06/10-DG-M-M Bi/Tri-Pressure Relief Valves

Model Code

(F3) C G - (H) 10 - F (E) C (V) - DG - 8C (P) - M (S1) (PA5) - M - WL - B(9) - P08 - 50

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21

1 Seals

F3 – For mineral oil and fire resistant fluids. Mounting face seals of CG model relief and all pilot valves have standard Buna-N seals unless specified as F3.
Blank – Omit for standard models

2 Valve Type

C – Relief valve

3 Connections

G – Manifold or subplate mounting
S – SAE straight thread
T – NPTF thread*
*Not recommended

4 High-flow Designation

H – High-flow valve (not available in CT models)
Blank – Omit if not required

5 Valve Size

06 – 1.0625-12 UN-2B straight thread (0.750 tubing) or $^{3}/_{4}$" pipe
10 – 1.6250-12 UN-2B straight thread (1.250 tubing) or $1^{1}/_{4}$" pipe (not available in CS or CT models)

6 Head No. 1 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)
E – Vent (tri-pressure models only)

7 Head No. 2 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)
E – Vent (tri-pressure models only)
Blank – Omit for bi-pressure models

8 Head No. 3 Pressure Range

B – 8,5 to 70 bar (125 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 100 to 210 bar (1500 to 3000 psi)
E – Vent (tri-pressure models only)

9 High Vent Spring

V – Optional high vent spring installed (required in high-flow models)
Blank – Omit if not required

10 Pilot Valve (DG4V-3 or DG4V-3S)

DG – Solenoid operated, sliding spool, four-way directional valve

11 Pilot Spool Function and Spring Arrangement

0A – Spring offset open center spool (bi-pressure models only)
8C – Spring centered tandem center spool with open center crossover (tri-pressure models only)

WARNING

Tandem center spool (8) must be used only with spring centered pilot valve (C). Open center spool (0) must be used only with spring offset pilot valve (A). Use of any other spools could be hazardous.

12 Manual Override

P – Plain override in both ends of single solenoid (bi-pressure models only)
Blank – Omit if not required

13 Flag Symbol

M – Electrical options and features

14 Spool Indicator Switch

For spring offset (A) models only. Not available in manual override models.
S – Switch unwired
S1 – Switch wired normally open
S2 – Switch wired normally closed
Blank – Omit if not required

15 Electrical Connections

PA3 – 3-pin receptacle (single solenoid models only)
PA5 – 5-pin receptacle
PB – "Insta-Plug" with male and female connectors
Blank – Omit if not required

16 Pilot and Adapter

M – DG4V-3(S) pilot valve with adapter plate*
*Refer to catalog GB-C-2015 for pilot and adapter plate mounting information.

17 Housing or Coil Type

(W or WL required for PA3 and PA5 models)
U – ISO 4400 (DIN 43650) connector
W – $^{1}/_{2}$" NPT thread wiring housing
WL – $^{1}/_{2}$" NPT thread wiring housing with coil indicator lights

18 Solenoid Coil Voltage Rating

A – 110V AC 50 Hz
B – 110V AC 50 Hz/120V AC 60 Hz
C – 220V AC 50 Hz
D – 220V AC 50 Hz/240V AC 60 Hz
G – 12V DC
H – 24V DC

19 Coil Wattage

9 – Low wattage coil*
Blank – Omit if not required
* Available only with B, G, and H voltage coils and only on -40 design models.

20 Pilot Valve Port Orifices

***00** – Solid plug
***03** – 0,30 (0.012)
***06** – 0,60 (0.024)
***08** – 0,80 (0.030)
***10** – 1,00 (0.040)
***13** – 1,30 (0.050)
***15** – 1,50 (0.060)
***20** – 2,00 (0.080)
***23** – 2,30 (0.090)
Blank – Omit if not required
* = P, T, A, or B as required

21 Design Number

40 – Model with DG4V-3S standard performance pilot valve
50 – Model with DG4V-3 high performance pilot valve

Subject to change. Installation dimensions same for designs 40 through 49 and for designs 50 through 59.

Series C*-06/10-DG-M-M Bi/Tri-Pressure Relief Valves

General Data

The -40 and -50 design multi-pressure solenoid operated relief valves are the same as the -20 design shown in the previous section, except for the pilot valve. The DG4S4-10 (NFPA-D05) pilot valve used in the -20 design is replaced by a smaller DG4V3 (NFPA-D03) valve. The -40 design uses a DG4V-**3S** (standard performance) pilot valve, and the -50 design uses a DG4V-3 (high performance) pilot valve.

Pressure relief performance of the -40 and -50 design valves is the same as for the -20 design valve, but pilot pressures as high as 350 bar (5075 psi) are possible with the -40 and -50 designs. The -50 design provide greater pilot flow capability.

The tri-pressure relief valve is a pressure control unit which can be used to electrically select any one of three preset pressures, or two pressures and vent. The bi-pressure relief valve can be used to electrically select either of two preset pressures, or one pressure and vent.

The main stage is a Vickers balanced piston type relief valve, and the intermediate stages are of the poppet spring type. As explained above, the pilot stage uses either a standard DG4V3S or high performance DG4V3 valve (see Vickers publication GB-C-2015B for more details).

Pressure Adjustment

Any head in the intermediate stage can contain a B, C, or F spring. The pressure ranges of these springs are shown in the following table.

Spring	Pressure Range bar (psi)
B	8,5 to 70 (125 to 1000)
C	35 to140 (500 to 2000)
F	100 to 210 (1500 to 3000)

The minimum pressure as indicated for the "B" spring is a function of flow and is shown on the corresponding Nominal Override Characteristics curves.

If there is an "E" in the model code, the corresponding control head contains no spring. When that head is put into operation, the system is vented. The vent pressure is shown on the Vent Pressure vs. Flow curves.

Pressure for each head can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Electrical Information

Solenoids

Solenoids "a" and "b" are identified on the unit by a diagram plate on the side of the pilot valve.

Solenoid Energizing

On tri-pressure models (C*-06/10-****-**DG*-**8C**-*-M-M-**-40/50), energizing solenoid "a" causes pilot head No. 3 to control the pressure. Energizing solenoid "b" causes pilot head No. 1 to control the pressure. With both solenoids de-energized, pilot head No. 2 will control the pressure. Solenoids must be kept energized to maintain a desired action.

On bi-pressure models (C*-06/10-****-**DG*-**0A**-*-M-M-**-40/50), de-energizing the solenoid causes pilot head No. 1 to control the pressure. Energizing the solenoid causes pilot head No. 3 to control the pressure. The solenoid must be kept energized to maintain the desired action.

WARNING

DG pilot valve must conform to relief valve type being used. If relief valve is tri-pressure, pilot stage must be DG4V-3(S)-**8C**. This valve contains type "8" tandem center open center crossover spool. If relief valve is bi-pressure, pilot stage must be DG4V-3(S)-**0A**. This valve contains type "0" open center spool. Use of incorrect spools could be hazardous.

Note

Any sliding spool valve, if held shifted under pressure for long periods of time, may stick and not spring return due to fluid residue formation. The valve should be cycled periodically to prevent this.

Spring centered and spring offset pilot valves are spring positioned unless the solenoid is energized continuously.

Application Guidance

High Flow Valve ("H" Model)

"H" series valves require the use of a high vent spring (CS-H06-BC**V**-DG or CG-H10-FCB**V**-DG).

Installation Data

Tank Connection

The tank connection should be piped directly to tank to minimize back pressure. Any back pressure in the tank line is additive to the valve pressure setting. If tank line back pressure exceeds system pressure by 7 bar (100 psi), a malfunction may occur.

Mounting

Inlet and outlet pressure connections (on straight or NPTF thread models) may be used interchangeably when the valve is mounted in the pressure line, or the valve may be teed off the pressure line with one of the pressure connections plugged. The tank connection should be piped directly to tank to minimize back pressure.

Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG-06-BCF-DG-8C-M-M-**-40 valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, $^5/_8$–11 x 2.75")

CGM-06S-20 and CGM-10S-20 subplate installation dimensions are shown in CG-06/10 section. When a subplate is not used, a machined pad (as indicated by subplate shaded area on pages 24 and 25) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

Ratings

Rated Pressure (Maximum)	210 bar (3000 psi)	
Rated Pressure (Maximum)	**Standard**	**"H"**
C*-06 and CG/S-H06	227 L/min (60 USgpm)	340 L/min (90 USgpm)
CG-10 and CG-H10	454 L/min (120 USgpm)	680 L/min (180 USgpm)

Internal Vent Tri-pressure Models

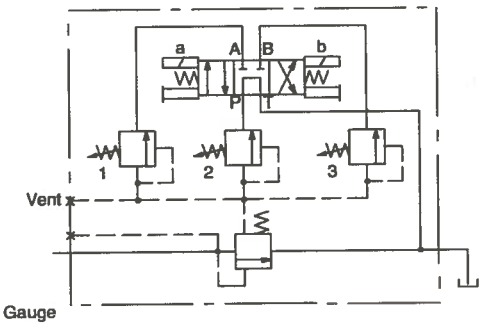
On internal vent models, one control head is open and is identified by the letter "E" in the model code. Venting can be set so as to be selected by solenoid "a" or solenoid "b". When control head No. 2 is open, venting takes place when both solenoids are de-energized.

Note

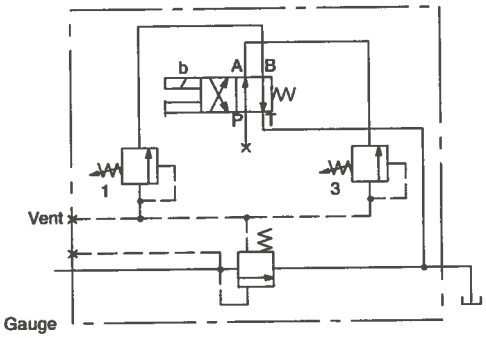
Only the tri-pressure models are recommended for internal venting. If a single solenoid pilot valve is required to select one pressure or vent, consider using a C*5-06/10 model (see page 28).

Graphical Symbols

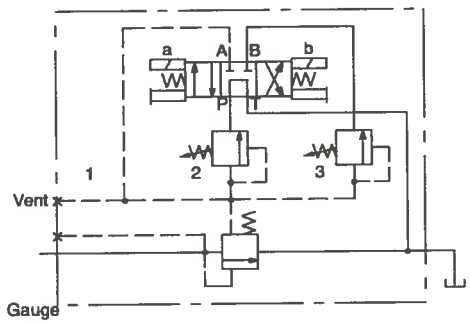
Tri-pressure Spring Centered Valve, 3-position
C*-**-***-DG-8C-M-M-**-40/50



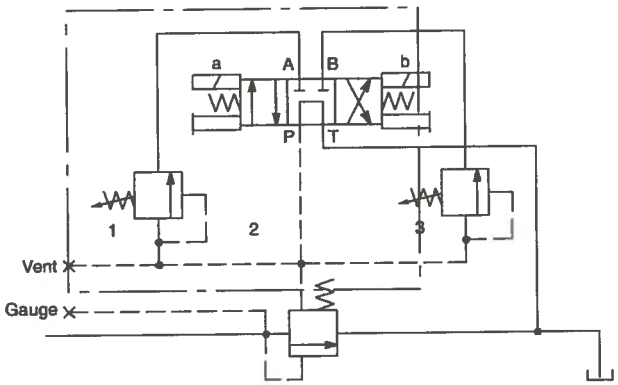
Bi-pressure Spring Offset Valve, 2-position
C*-**-**-DG-0A-M-M-**-40/50



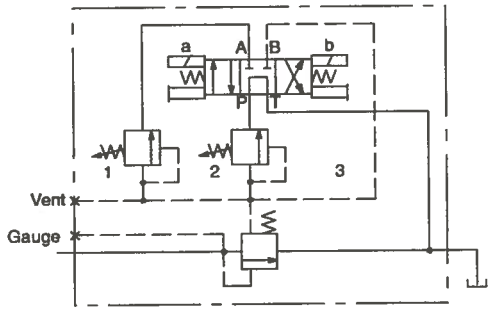
Tri-pressure Spring Centered Valve, 3-position
C*-**-E**-DG-8C-M-M-**-40/50



Tri-pressure Spring Centered Valve, 3-position
C*-**-*E*-DG-8C-M-M-**-40/50



Tri-pressure Spring Centered Valve, 3-position
C*-**-**E-DG-8C-M-M-**-40/50

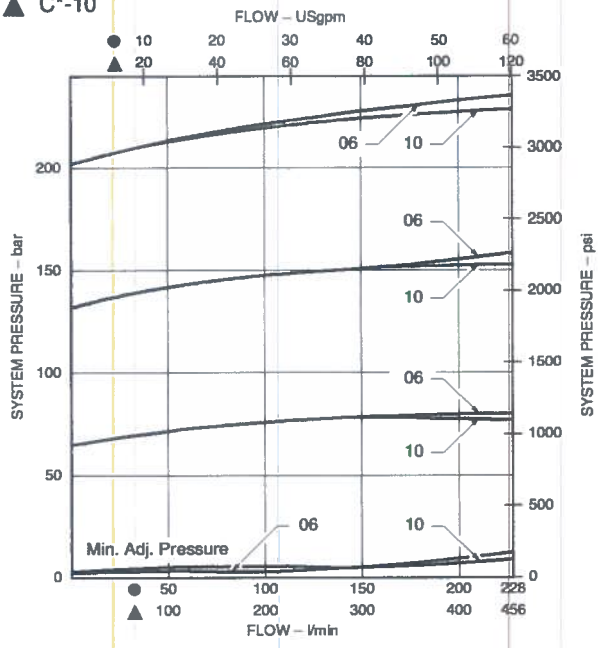


Series C*-06/10-DG-M-M Bi/Tri-Pressure Relief Valves

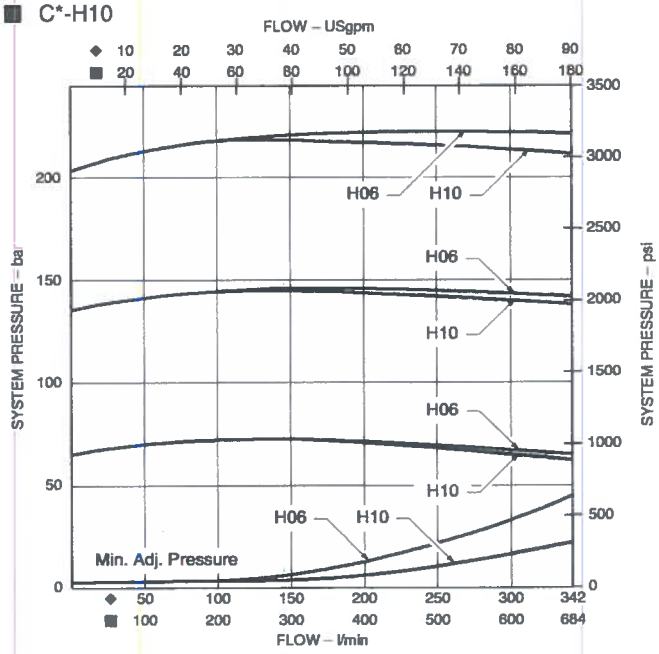
Performance Curves

Nominal Override Characteristics

● C*-06
▲ C*-10

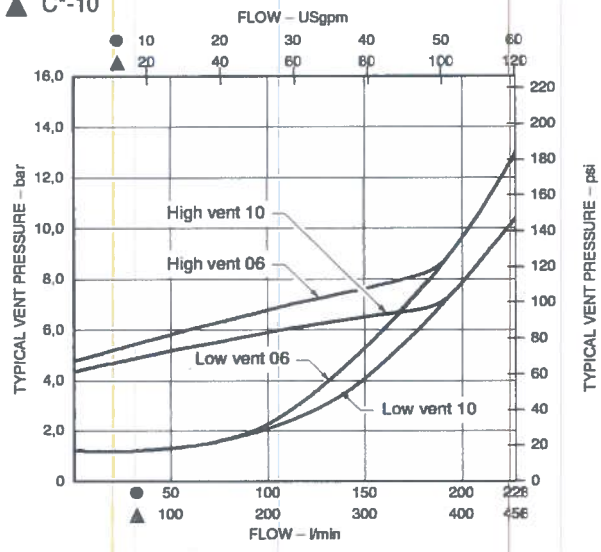


◆ C*-H06
■ C*-H10

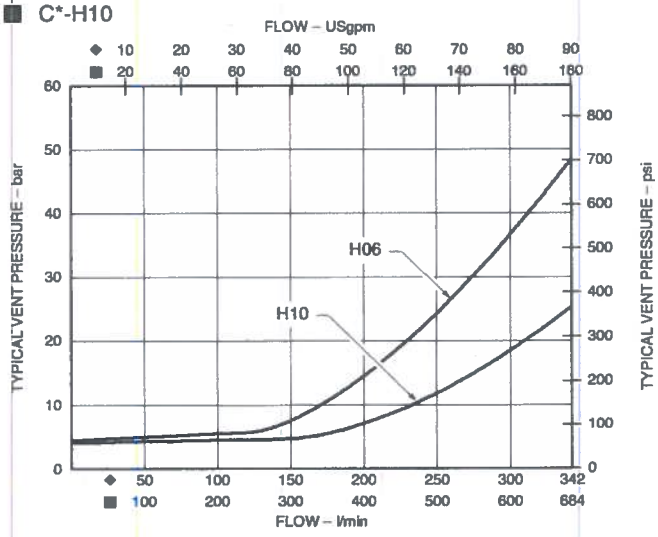


Vent Pressure Versus Flow

● C*-06
▲ C*-10



◆ C*-H06
■ C*-H10



Installation Dimensions

mm (inch)

Subplate or Manifold Mounted Models

Bi-pressure CG-(H)-**DG-0A-M-M-**-*-40/50 and**
Tri-pressure CG-(H)-***DG-8C-M-M-**-*-40/50**

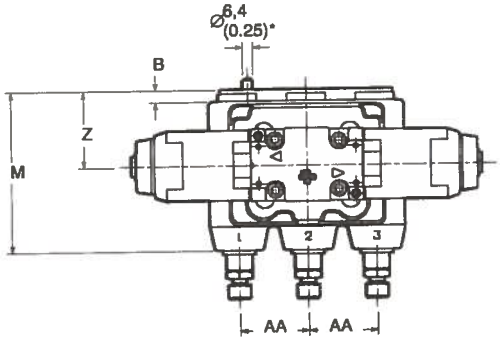
Note

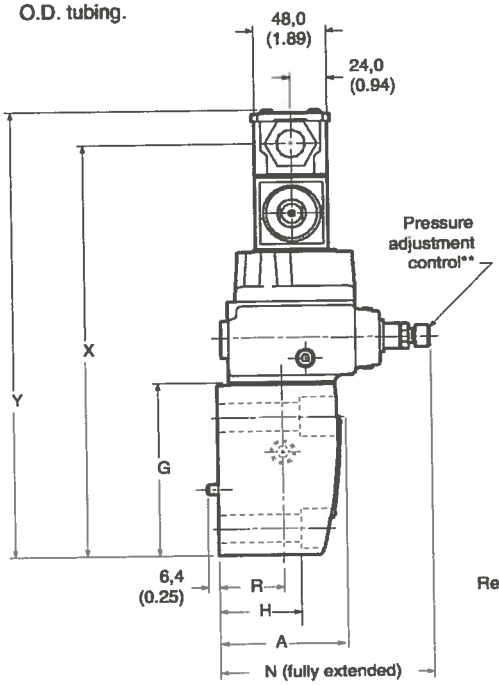
* See mounting subplates (page 24) for locating dimensions.

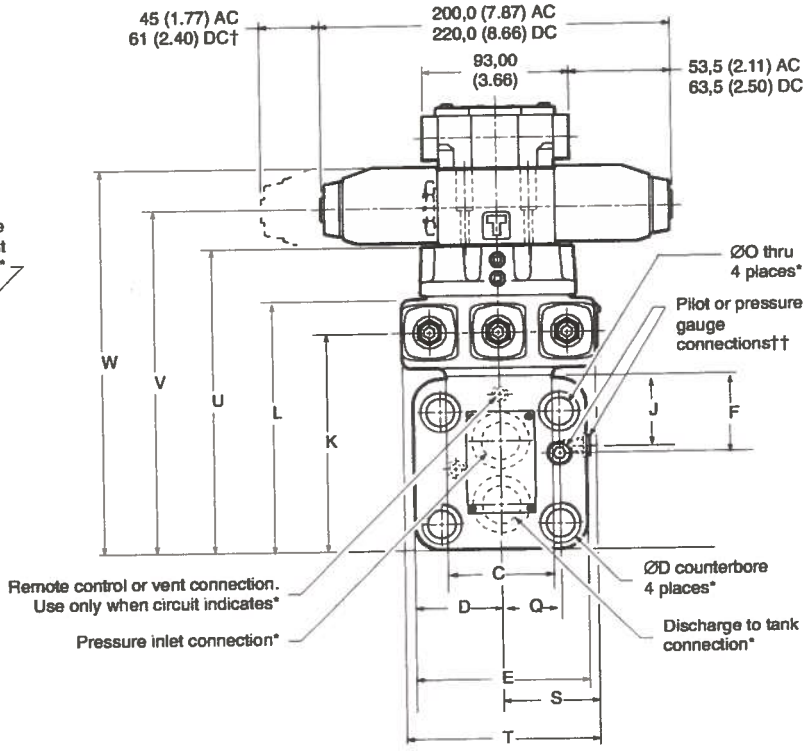
** Use 7,92 (0.312) hex key.

† Clearance for removal of solenoid coil.

†† .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.







Model	A	B	C	D	E	F	G	H	J	K	L	M	N
CG-(H)06-DG	71,4 (2.81)	7,9 (0.31)	62,0 (2.44)	53,3 (2.10)	106,4 (4.19)	47,8 (1.88)	107,2 (4.22)	47,8 (1.88)	42,9 (1.69)	131,1 (5.16)	156,5 (6.16)	100,8 (3.97)	159,5 (6.28)
CG-(H)10-DG	85,9 (3.38)	2,3 (0.31)	81,0 (2.44)	66,8 (2.63)	133,4 (5.25)	55,6 (2.19)	116,1 (4.57)	63,5 (2.50)	50,8 (2.00)	141,5 (5.57)	164,6 (6.48)	104,7 (4.12)	163,6 (6.44)

Model	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
CG-(H)06-DG	16,6 (1.38)	24,5 (0.96)	35,1 (1.38)	35,9 (1.53)	55,6 (2.19)	111,3 (4.38)	184,9 (7.28)	209,8 (8.26)	235,7 (9.28)	253,5 (9.98)	275,6 (10.85)	48,5 (1.91)	39,6 (1.56)
CG-(H)10-DG	19,8 (0.78)	29,3 (1.15)	46,0 (1.81)	42,9 (1.69)	62,7 (2.47)	125,5 (4.94)	196,1 (7.72)	221,0 (8.70)	246,9 (9.72)	264,4 (10.41)	286,8 (11.29)	60,5 (2.38)	46,7 (1.84)

Series C*-06/10-DG-M-M Bi/Tri-Pressure Relief Valves

Threaded Port Models

mm (inch)

Bi-pressure
CS/T-(H)06-DG-0A-M-M-**-*-40/50**
and Tri-pressure
CS/T-(H)06-*DG-8C-M-M-**-*-40/50**

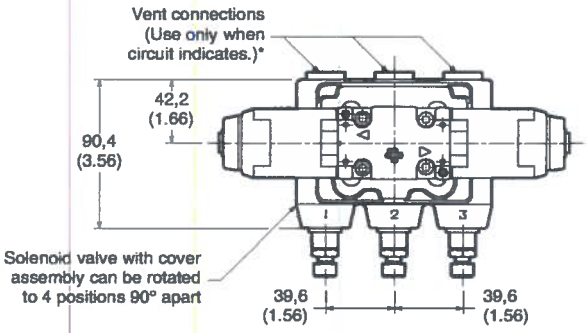
Note

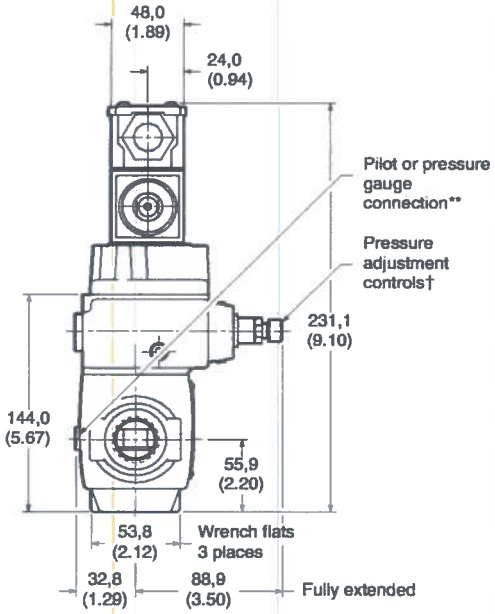
* .7500-16 UNF-2B thread for 0.500 O.D. tubing.

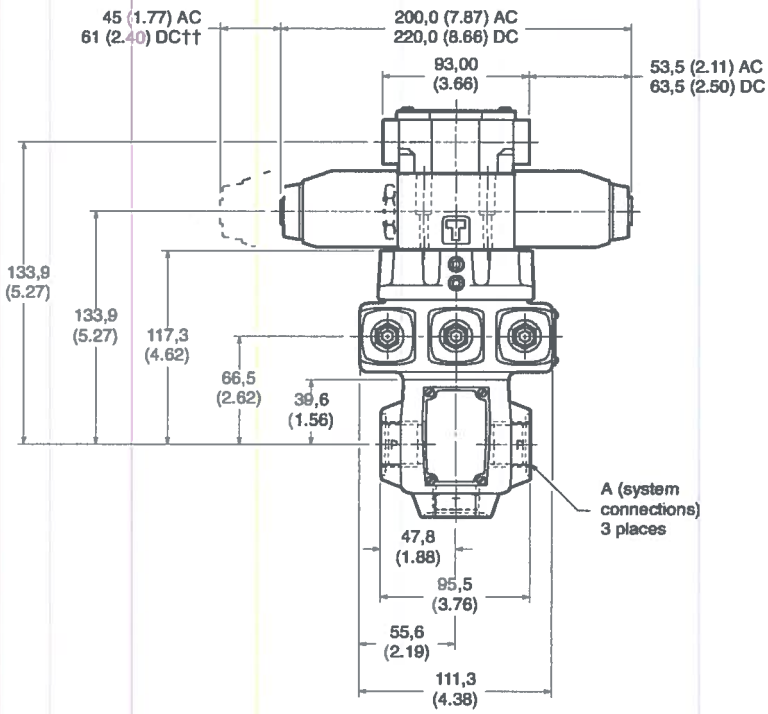
** .4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

† Use 7,92 (0.312) hex key.

†† Clearance for removal of solenoid coil.







Model	A
CS-(H)06-DG	1.0625-12 UN-2B thd. for 0.750 O.D. tubing
CT-(H)06-DG	3/4" NPTF thd.■

■ Not recommended

Application Data

Weights

The following table lists the approximate weight of each valve in the catalog:

Valve	Weight kg (lbs)
CGR-02	1,4 (3)
C-175	1,8 (4)
CG-03	3,2 (7)
CS/T-03/06	2,7 (6)
CG-06	5,0 (11)
CG-10	8,6 (19)
CG5-06	8,4 (18.5)
CG5-10	11,1 (24.5)
CS/T-03/06	6,1 (13.5)
CS/T-10	8,6 (19)
CG19-(H)06	7,8 (17.2)
CG19-(H)10	10,5 (23.2)
CT19-06	4,8 (12.9)
CT19-10	7,3 (18.4)
CG-(H)06-DG	11,8 (26)
CG-(H)10-DG	18,1 (40)
CS/T-(H)06-DG	10,0 (22)
CG-(H)06-DG-M-M	11,3 (25)
CG-(H)10-DG-M-M	17,7 (39)
CS/T-(H)06-DG-M-M	10,0 (22)

The following table lists the approximate weight of each subplate in the catalog:

Subplate	Weight kg (lbs)
CGM-10S-03-10	1,6 (3.5)
CGMT-03-10	1,6 (3.5)
CGM-06S-20	3,4 (7.5)
CGM-10S-20	6,8 (15.0)

Fluids and Seals

For best results, oil viscosity should range between 32 cSt and 49 cSt (150 SUS and 225 SUS) at 38°C (100°F). Maximum operating temperature is 66°C (150°F) for the CGR-02 and 68°C (155°F) for all other models. Water glycol, water-in-oil emulsions, and petroleum oil may be used with non-F3 models, which are furnished with Buna-N seals for the mounting surface and fluorocarbon seals internally. Add F3 prefix when phosphate ester type fluids or blends are to be used. All seals of the F3 models are fluorocarbon, including the mounting surface seals.

Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) CG5-062C-F-M-W-*-110 valve
(1) CGM-06S-20 subplate
(1) BKCG06604 bolt kit (consisting of four bolts, $^5/_8$–11 x 2.75")

The following table lists the appropriate bolt kit for each subplate mounted valve in the catalog:

Valve	Bolt Kit
CG-03-B-10	BKCG03602
CG-(H)06-*(V)-50	BKCG06604
CG-06-*(V)Y-50	BKCG06605
CG-(H)10-*(V)-30	BKCG10616
CG-10-*(V)Y-30	BKCG10616
CG5-06*-110	BKCG06604
CG5-10*-110	BKCG10616
CG19-06*-100	BKCG06604
CG19-10*-100	BKCG10616
CG-(H)06-DG*-20/40/50	BKCG06604
CG-(H)10-DG*-20/40/50	BKCG10616

When a subplate is not used, a machined pad (as indicated by shaded area on subplate installation dimensions pages) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

Fluid Cleanliness

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity, and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561 "Vickers Guide to Systemic Contamination Control" available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

The recommended fluid cleanliness level is: **19/17/14**

2-18

Notes

Notes

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www.eatonhydraulics.com

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Fax: (44) 170-548-7110

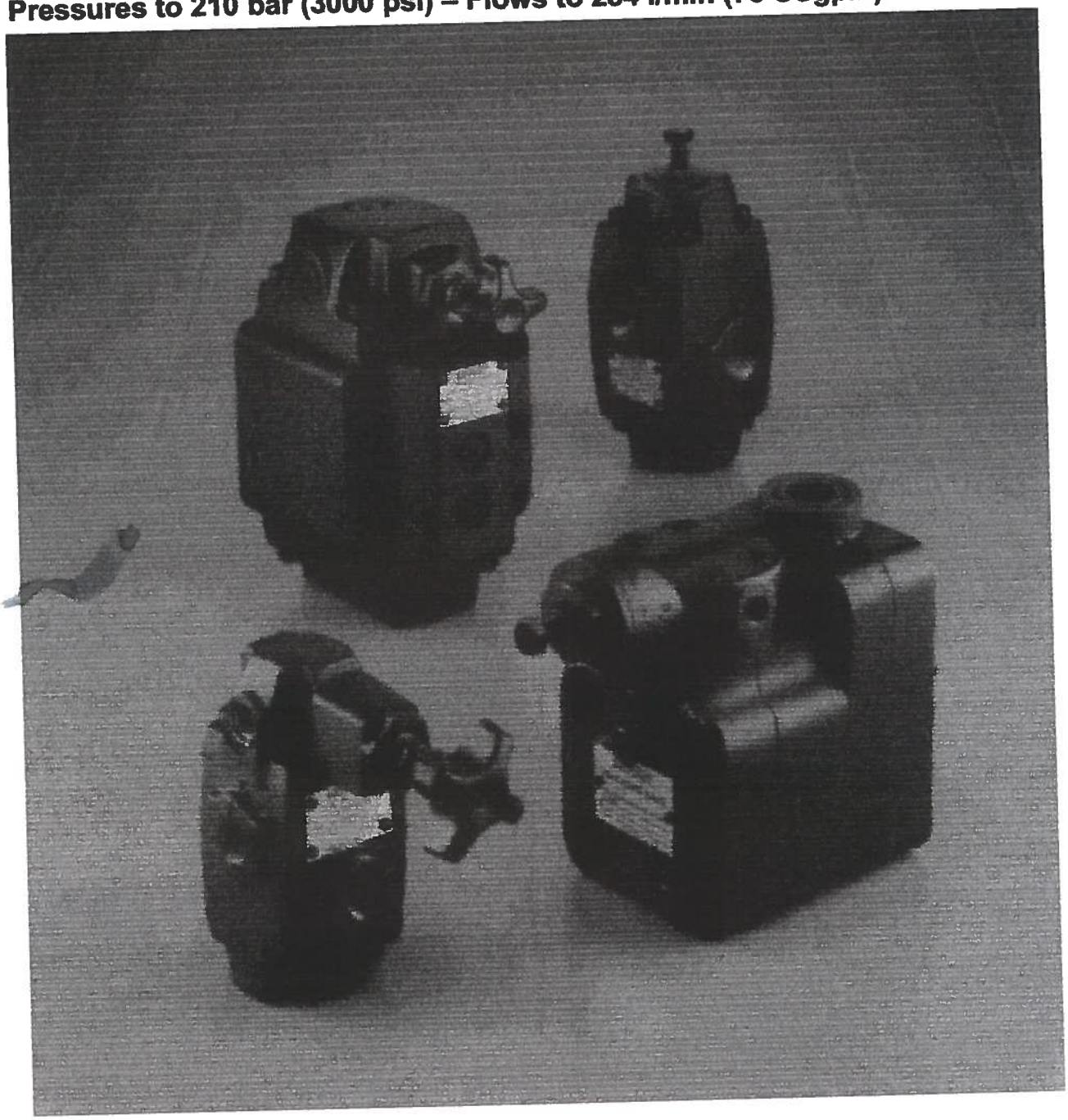
Vickers®

Pressure Relief

EATON

Sequence, Unloading, Back Pressure, Counterbalance, and Reducing Valves

"R", "UR", and "X" 03/06/10/12 Series
Pressures to 210 bar (3000 psi) – Flows to 284 l/min (75 USgpm)



VICKERS

Released 7/94

Introduction

"R" Series Sequence, Unloading, Back Pressure, and Counterbalance Valves

There are several configurations of this basic valve which can be made by changing cover positions. The following outlines each type of function.

Sequence and Unloading

Vickers "Hydrocushion" type pressure control valves are used for the control of unloading and sequence of oil flow in hydraulic systems, induced by a pressure rise, directly or by remote means. They are available in the following types: sequence valve, Type 2—directly operated; sequence valve, Type 3—remotely controlled; unloading valve, Type 4—remotely controlled.

Back Pressure

Back pressure valves are designated as Type 1—internally operated. They are used to provide back pressure on the hydraulic actuator to prevent overrunning. A remote 'P' version is also available for use in braking circuits.

Counterbalance

Vickers "Hydrocushion" type counterbalance valves are used for the control of unloading and sequence of oil flow in hydraulic systems, induced by pressure rise either directly or by remote means. They are available in the following types: counterbalance valve, Type 1—internally operated; counterbalance valve, Type 4—remotely controlled. These valves are usually applied in a system to keep a vertical load from falling. All models provide free reverse flow by means of an integral check valve. (Refer to valves without integral check when reverse free flow is not required.)

"UR" Series Unloading Relief Valves with Integral Check Module

An integral check valve prevents return flow from the accumulator through the unloading valve. In an accumulator system, the valve cuts out automatically when the accumulator pressure reaches adjusted maximum. At cut-in pressure (approximately 85% of adjusted maximum), the valve directs delivery to the accumulator and the hydraulic system automatically.

In a double pump system, the valve automatically sequences the pumps to deliver a large volume of oil at low pressure and a small volume of oil at high pressure.

Models designated "URT" have threaded ports and require a separate check valve to function as an unloading circuit.

"X" Series Pressure Reducing Valves

These pressure reducing valves maintain a reduced level of outlet pressure regardless of variations in inlet pressure above the pressure setting of the valve. The valves also allow reverse free flow at pressures below the setting of the valve.

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Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

Ratings

Rated Pressure (Maximum)*	210 bar (3000 psi)
Rated Capacity (Maximum)**	
R*-03	45 l/min (12 USgpm)
R*-06	114 l/min (30 USgpm)
R*-10 and R*-12	284 l/min (75 USgpm)

* 140 bar (2000 psi) permitted on the full piston area at the bottom cover ("P" connection), and at the top cover (spring chamber). See tank drain information on page 4.

**Rated capacities are based on using fluid with a specific gravity of 0.865 and a viscosity of 20 cSt (100 SUS).

Model Code

(F3)R(C)S - 06 - B P 1 - 30

1 2 3 4 5 6 7 8 9

1 Special seals

F3 – For mineral oil and fire resistant fluids. Mounting face seals of RCG model are standard Buna-N unless specified as F3.

Blank – Omit for standard, R(C)S, and R(C)T models.

2 Valve type

R – Pressure control valve

3 Integral check valve

C – Reverse free flow check

4 Connections

G – Manifold or subplate mounting
S – SAE straight thread
T – NPTF thread*

*Not recommended

5 Valve size

03 – $^3/_8$" pipe or 0.7500-16 UNF-2B straight thread (0.500 tubing)
06 – $^3/_4$" pipe or 1.0625-12 UN-2B straight thread (0.750 tubing)
10 – $1^1/_4$" pipe or 1.6250-12 UN-2B straight thread (1.250 tubing)
12 – $1^1/_2$" pipe or 1.8750-12 UN-2B straight thread (1.500 tubing) (not available in R(C)G models)

6 Pressure range

X – 0,7 to 2,1 bar (10 to 30 psi)
Y – 2,1 to 4,1 bar (30 to 60 psi)
Z – 4,1 to 8,5 bar (60 to 125 psi)
A – 5,2 to 17,2 bar (80 to 250 psi)
B – 8,5 to 35 bar (125 to 500 psi)
D – 17,2 to 70 bar (250 to 1000 psi)
F – 35 to 140 bar (475 to 2000 psi)

7 Remote control connection

P – Auxiliary remote pressure control connection (not available with X, Y, or Z pressure ranges or in R(C)G-03 models)

Blank – Omit if not required

8 Valve application type

1 – Internal drain directly operated
2 – External drain directly operated
3 – External drain remotely operated
4 – Internal drain remotely operated

9 Design number

Subject to change. Installation dimensions same for designs 30 through 39.

Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

General Data

Vickers "hydrocushion" type pressure control valves are used to control the sequencing, unloading, back pressure, and counterbalancing of oil flow in hydraulic systems. Control is initiated by a pressure rise which can be sensed either internally (directly) or remotely. Models are available with or without integral reverse free flow checks.

Pressure Adjustment

Pressure ranges – (see model code page 3) are maximum controllable, and each model selected should be well within the range given to afford fine increments of adjustment. Pressure setting must be at least 17 bar (250 psi) lower than the system relief valve setting.

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Installation Data

Mounting

Because all R(C)T and R(C)S models have optional pressure inlets connected by a through passage, the valves may be mounted "in-line". The valves may also be teed to a line by using either one of the pressure inlets and plugging the other.

The remote pressure control connection on type 3 and 4 valves must be connected to an external pilot pressure source sufficient to operate the valve at the desired pressure setting and flow conditions.

Tank Drain

The discharge outlet of valve types 1 and 4 must be piped to tank at atmospheric pressure. The drain connection on types 2 and 3 must be piped directly to tank at atmospheric pressure. Any pressure at the drain port must be added to the pressure setting of the valve.

Auxiliary Remote Pressure Control "P"

All models (except R(C)G -03 and those with an "X", "Y", or "Z" pressure adjustment range in their model code) are available with an auxiliary remote control connection. Required pressure at the auxiliary connection is $^1/_{16}$ of the normally required control pressure for the "F" pressure range and $^1/_8$ of the normally required control pressure for the "A", "B", and "D" pressure ranges. (This applies to -22 design and up.)

Brake Valve

A brake valve is used in the exhaust line of a hydraulic motor to: 1) prevent overspeeding when an overrunning load is applied to the motor shaft; and 2) prevent excessive pressure buildup when decelerating or stopping a load.

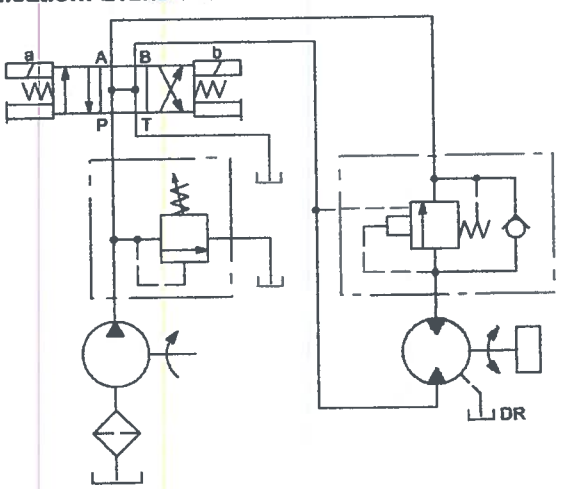
When the "RC" valve is used as a brake valve, it has a solid spool (no drain hole through the center), and there is a remote operating pressure connection in the bottom cover directly under the spool. This connection is teed into the supply line to the motor. The internal control connection is also used under the small piston and senses pressure from the primary port of the "RC" valve, which is connected to the motor exhaust port.

When the load is being accelerated, pressure is maximum at the motor inlet and under the large area of the brake valve spool, holding it in the full open position and permitting free flow from the exhaust port of the motor.

When the motor gets up to speed, load pressure still holds the brake valve open unless the load tries to run away. If this happens, the pressure falls off at the motor inlet and in the remote control pressure passage. The spring force tends to close the valve, thus increasing the back pressure on the motor, tending to brake it.

When the directional valve is shifted to neutral, inertia may cause the motor to continue rotating against the brake valve. Until the motor stops turning, it will operate as a pump, drawing fluid from the motor outlet through the directional valve and circulating it back to the motor inlet. Motor leakage oil will be made up by drawing oil into the loop through the tank port of the valve. At this time, pressure at the motor outlet tending to bring it to a stop will be whatever is required under the small piston to overcome the brake valve setting.

Typical Application: Brake Valve



Pressure Drop

The following table lists approximate pressure drops (ΔP) when passing flow of fluid with a specific gravity of 0.865 and a viscosity of 20 cSt (100 SUS).

Valve	Reverse Free Flow Pressure Drop	
	Flow l/min (USgpm)	ΔP bar (psi)
RC*-03	45 (12)	5,5 (80)
RC*-06	114 (30)	3,4 (50)
RC*-10	189 (50)	2,8 (40)
RC*-12	189 (50)	2,4 (35)

For any other flow rate (Q_1), the approximate pressure drop (ΔP_1) can be calculated using the following formula:

$$\Delta P_1 = \Delta P \, (Q_1 / Q_2)^2.$$

For any other viscosity of fluid, the pressure drop will change according to the following table:

Viscosity cSt (SUS)	Approximate % of ΔP
14 (75)	93
27 (150)	111
38 (200)	119
46 (250)	126
56 (300)	132
64 (350)	137
74 (400)	141

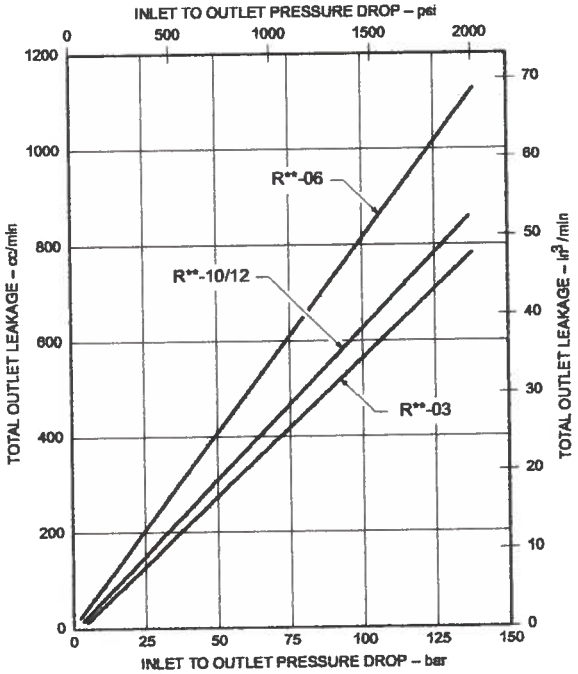
For any other specific gravity (G_1), the approximate pressure drop (ΔP_1) can be calculated using the following formula:

$$\Delta P_1 = \Delta P \, (G_1 / G).$$

The specific gravity of fluid may be obtained from its producer. The value is higher for fire-resistant fluids than for oil.

Maximum Total Leakage vs. Pressure Drop

The following graph shows the relationship between maximum total leakage and pressure drop for fluid with a specific gravity of 0.865 and a viscosity of 20 cSt (100 SUS). Leakage is approximately proportional to viscosity in centistokes.

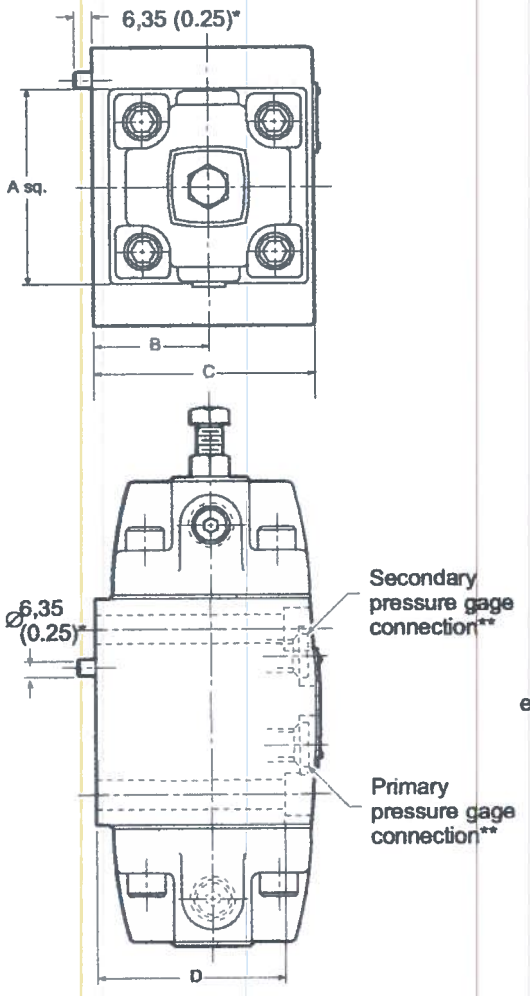


Installation Dimensions

Millimeters (inches)

Subplate or Manifold Mounted Models

RG--**-30 Without Check**

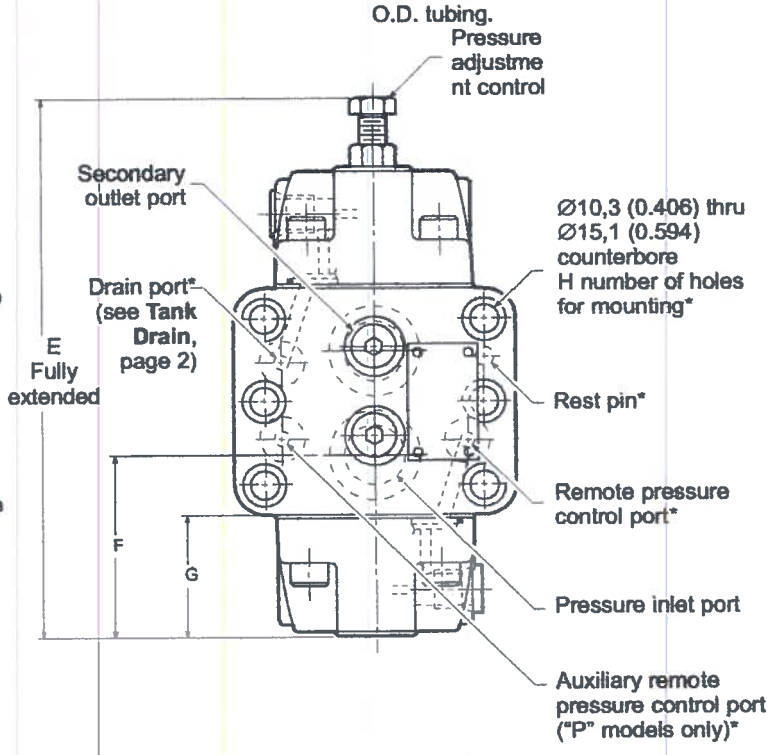


NOTES

Sequence valve shown (remotely controlled, external drain, type 3).

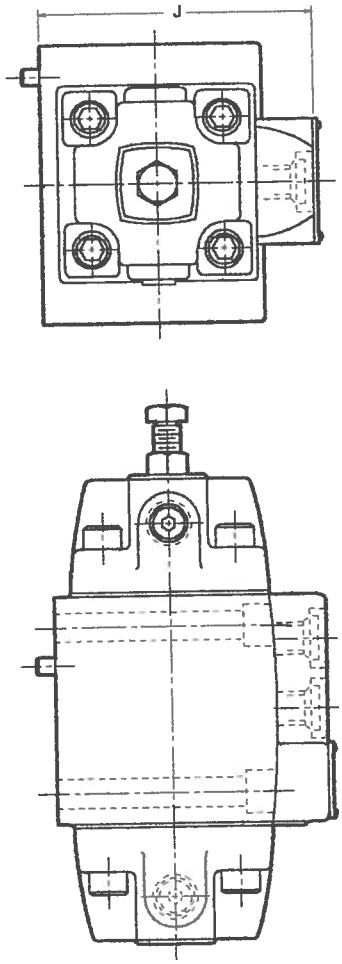
* See mounting subplates for locating dimensions.

**.4375-20 UNF-2B straight thread for 0.250 O.D. tubing.


Pressure adjustment control
Secondary outlet port
Drain port* (see Tank Drain, page 2)
E Fully extended
Ø10,3 (0.406) thru Ø15,1 (0.594) counterbore H number of holes for mounting*
Rest pin*
Remote pressure control port*
F
G
Pressure inlet port
Auxiliary remote pressure control port ("P" models only)*

Model	A	B	C	D	E	F	G	H	J	NFPA Interface
R(C)G-03-**-30	57,2 (2.25)	36,6 (1.44)	68,1 (2.68)	55,9 (2.20)	178,6 (7.03)	47,5 (1.87)	30,0 (1.18)	4	90,4 (3.56)	P03
R(C)G-06-**-30	71,4 (2.81)	41,1 (1.62)	79,2 (3.12)	73,7 (2.90)	201,4 (7.93)	67,6 (2.66)	45,2 (1.78)	4	98,6 (3.88)	P06
R(C)G-10-**-30	95,2 (3.75)	50,8 (2.00)	100,1 (3.94)	90,2 (3.55)	282,2 (11.11)	71,6 (2.82)	44,4 (1.75)	6	130,0 (5.12)	P10

RCG--**-30 With Check**

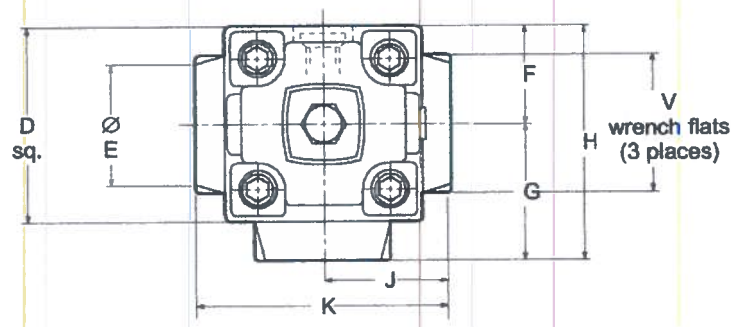


NOTE

Sequence valve shown (remotely controlled, external drain, type 3).

Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

Threaded Port Models
RS/T--**-30 Without Check**



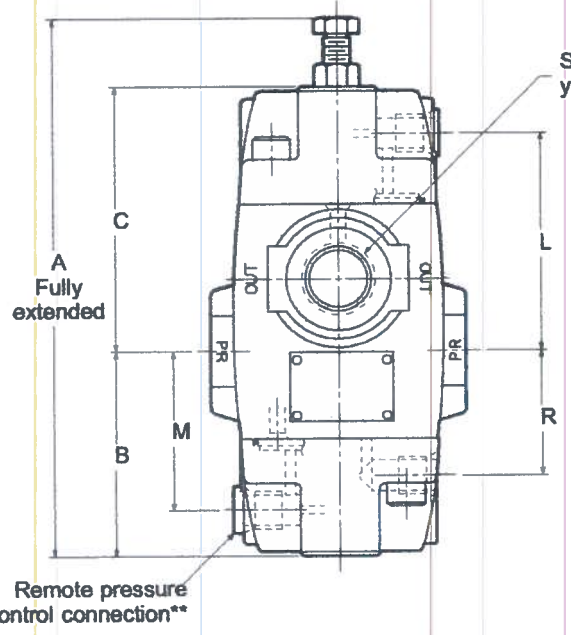
NOTES

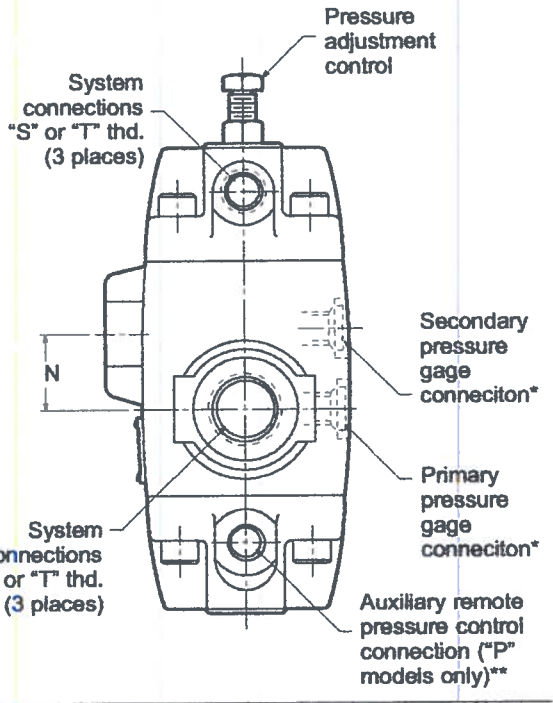
Sequence valve shown (directly operated, external drain, type 2).

All external connections are straight thread (except inlet and outlet ports of R(C)T models).

*.4375-20 UNF-2B straight thread for 0.250 O.D. tubing.

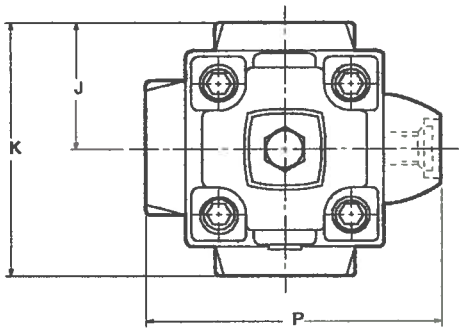
**.5627-18 UNF-2B thread

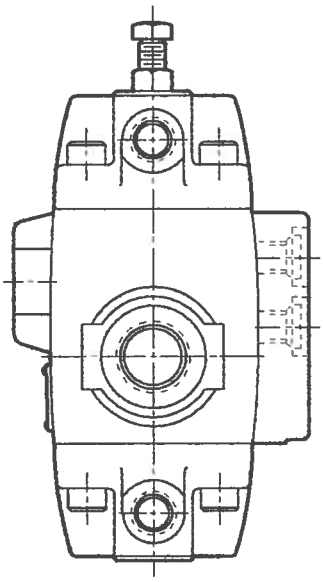




Model	A	B	C	D	E	F	G	H	J	K
R(C)S/T-03-**-30	178,6 (7.03)	53,3 (2.12)	96,8 (3.81)	59,4 (2.34)	35,1 (1.38)	29,7 (1.17)	39,6 (1.56)	70,9 (2.79)	35,1 (1.38)	69,8 (2.75)
R(C)S/T-06-**-30	201,4 (7.93)	75,4 (2.97)	97,8 (3.85)	74,7 (2.94)	47,8 (1.88)	37,3 (1.47)	50,8 (2.00)	88,1 (3.47)	47,8 (1.88)	95,2 (3.75)
R(C)S/T-10-**-30	282,2 (11.11)	84,1 (3.31)	154,2 (6.07)	98,6 (3.88)	82,6 (3.25)	49,3 (1.94)	68,3 (2.69)	117,6 (4.63)	53,8 (2.12)	108,0 (4.25)
R(C)S/T-12-**-30	282,2 (11.11)	84,1 (3.31)	154,2 (6.07)	98,6 (3.88)	82,6 (3.25)	49,3 (1.94)	68,3 (2.69)	117,6 (4.63)	53,8 (2.12)	108,0 (4.25)

RCS/T- * * - * * -30 With Check





NOTE
Sequence valve shown (remotely controlled, external drain, type 3).

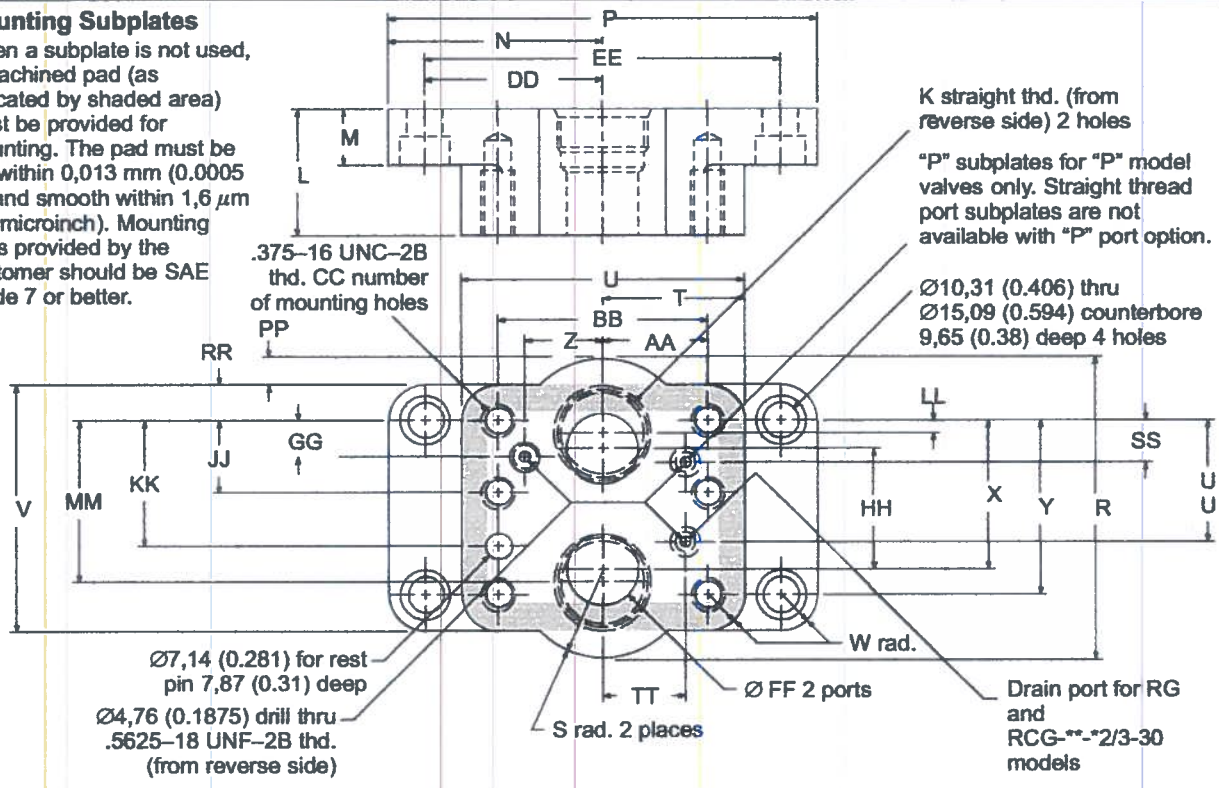
Model	L	M	N	P	R●	"S" Str. Thd. RS and RCS Models	"T" Str. Thd.■ RT and RCT Models	V
R(C)S/T-03-**-30	58,7 (2.31)	42,9 (1.69)	23,1 (0.91)	93,7 (3.69)	38,9 (1.53)	.7500–16 UNF–2B	3/8	35,1 (1.38)
R(C)S/T-06-**-30	79,5 (3.13)	57,2 (2.25)	27,2 (1.07)	108,0 (4.25)	46,7 (1.84)	1.0625–12 UN–2B	3/4	50,8 (2.00)
R(C)S/T-10-**-30	80,3 (3.16)	70,6 (2.78)	28,7 (1.13)	147,6 (5.81)	57,2 (2.25)	1.6250–12 UN–2B	1 1/4	86,4 (3.40)
R(C)S/T-12-**-30	80,3 (3.16)	70,6 (2.78)	28,7 (1.13)	147,6 (5.81)	57,2 (2.25)	1.8750–12 UN–2B	1 1/2	86,4 (3.40)

● For "P" models only. See model code.
■ Not recommended.

Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

Mounting Subplates

When a subplate is not used, a machined pad (as indicated by shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 µm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.



Model	K	Tube O.D.	L	M	N	P	R	S	T	U	V
RXGM-03S-(P)-20	.7500–16 UNF–2B	1/2"	25,4 (1.00)	19,0 (0.75)	63,5 (2.50)	127,0 (5.00)	76,2 (3.00)	23,9 (0.94)	43,7 (1.72)	87,4 (3.44)	63,5 (2.50)
RXGM-06SX-(P)-20	1.3125–12 UN–2B	1"	31,8 (1.25)	19,0 (0.75)	73,2 (2.88)	146,0 (5.75)	117,3 (4.62)	39,6 (1.56)	50,8 (2.00)	101,6 (4.00)	82,6 (3.25)
RXGM-10S-(P)-30	1.6250–12 UN–2B	1 1/4"	47,8 (1.88)	22,4 (0.88)	79,2 (3.12)	158,8 (6.25)	146,0 (5.75)	47,8 (1.88)	58,7 (2.31)	117,3 (4.62)	104,6 (4.12)

Model	W	X	±0,13 Y (±0.005)	Z	AA	BB	CC	DD	±0,013 EE(±0.005)	FF	GG
RXGM-03S-(P)-20	10,4 (0.41)	35,8 (1.41)	42,87 (1.688)	25,4 (1.00)	33,3 (1.31)	66,5 (2.62)	4	53,1 (2.09)	106,37 (4.188)	14,2 (0.56)	21,3 (0.84)
RXGM-06SX-(P)-20	10,2 (0.44)	49,3 (1.94)	60,32 (2.375)	33,3 (1.31)	39,6 (1.56)	79,2 (3.12)	4	62,0 (2.44)	123,82 (4.875)	23,1 (0.91)	20,6 (0.81)
RXGM-10S-(P)-30	10,4 (0.41)	67,6 (2.66)	84,12 (3.312)	44,4 (1.75)	48,5 (1.91)	96,8 (3.81)	6	69,1 (2.72)	138,12 (5.438)	28,4 (1.12)	24,6 (0.97)

Model	HH	JJ■	KK	LL	MM	PP	RR	SS	TT	UU	NFPA Interface
RXGM-03S-(P)-20	28,4 (1.12)	—	31,8 (1.25)	4,8 (0.19)	38,1 (1.50)	6,4 (0.25)	10,4 (0.41)	—	25,4 (1.00)	21,3 (0.84)	P03
RXGM-06SX-(P)-20	38,1 (1.50)	—	44,4 (1.75)	6,4 (0.25)	53,8 (2.12)	17,5 (0.69)	11,2 (0.44)	16,8 (0.66)	33,3 (1.31)	39,6 (1.56)	P06
RXGM-10S-(P)-30	50,8 (2.00)	42,2 (1.66)	62,7 (2.47)	7,9 (0.31)	76,2 (3.00)	20,6 (0.81)	10,4 (0.41)	24,6 (0.97)	44,4 (1.75)	59,4 (2.34)	P10

■ RXGM-03S/06SX require 4 valve mounting screws. RXGM-10S requires 6 valve mounting screws.

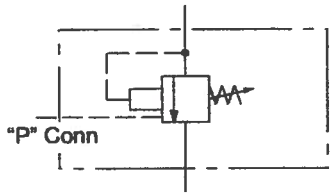
Graphical Symbols

Type P Back Pressure and Counterbalance Valves

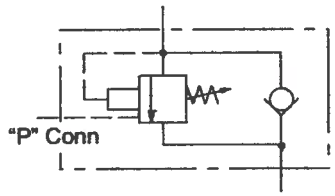
Auxiliary remote control operated with "P" connection – Internal drain (model ""P1" shown)

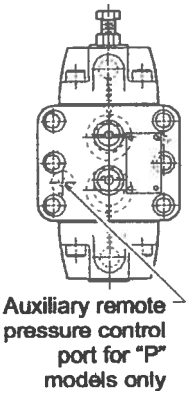
R(C)G Valves

Back Pressure (RG)



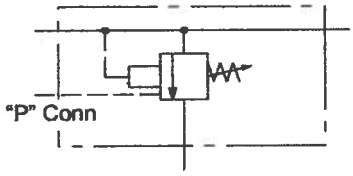
Counterbalance (RCG)



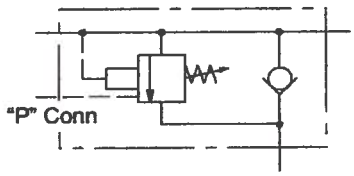


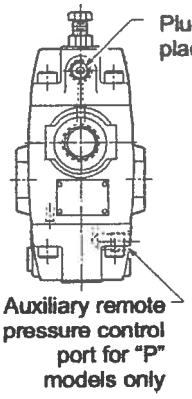
R(C)S/T Valves

Back Pressure (RS/T)



Counterbalance (RCS/T)



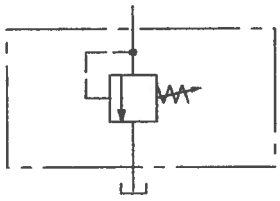


Type 1 Back Pressure and Counterbalance Valves

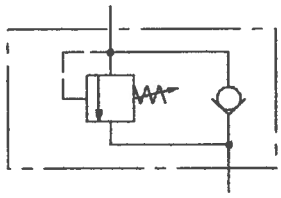
Internally operated – Internal drain

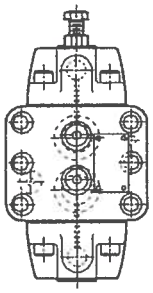
R(C)G Valves

Back Pressure (RG)



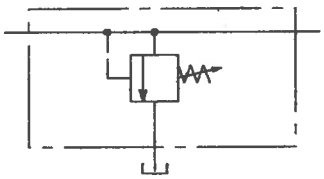
Counterbalance (RCG)



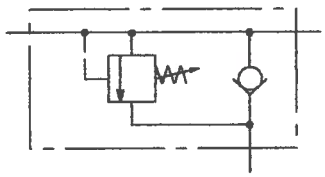


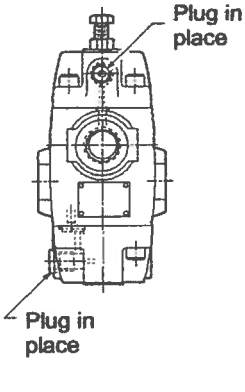
R(C)S/T Valves

Back Pressure (RS/T)



Counterbalance (RCS/T)





Series R(C)*-03/06/10/12 Sequence, Unloading, Back Pressure, and Counterbalance Valves

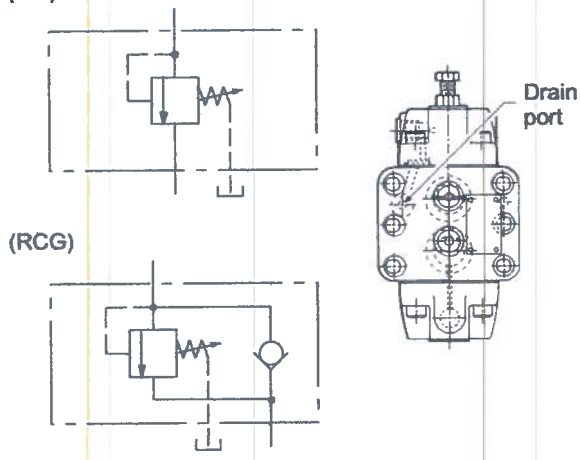
Type 2 Sequence Valves

Internally operated – External drain

R(C)G Valves

(RG)

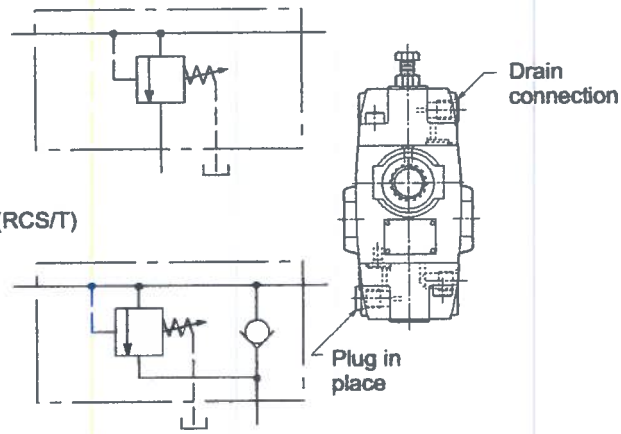
(RCG)



R(C)S/T Valves

(RS/T)

(RCS/T)



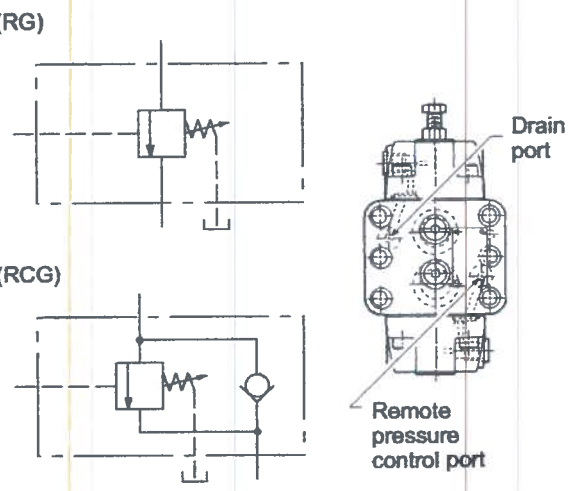
Type 3 Sequence Valves

Remote control operated – External drain

R(C)G Valves

(RG)

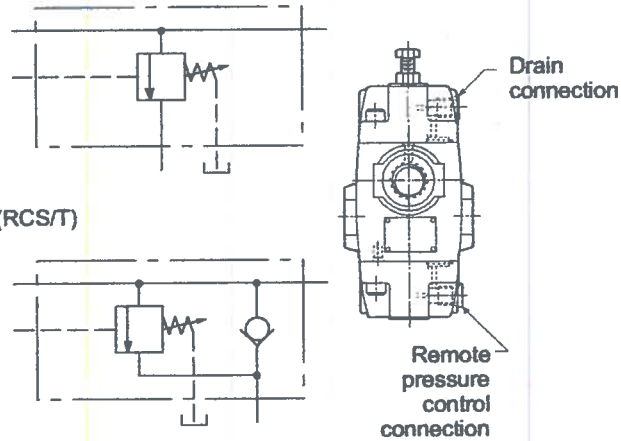
(RCG)



R(C)S/T Valves

(RS/T)

(RCS/T)

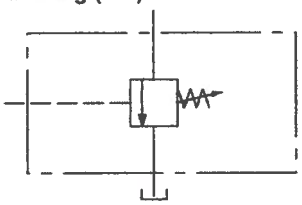


Type 4 Unloading and Counterbalance Valves

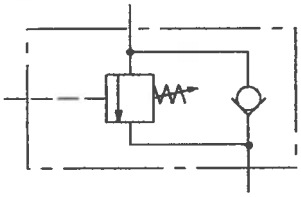
Remote control operated – Internal drain

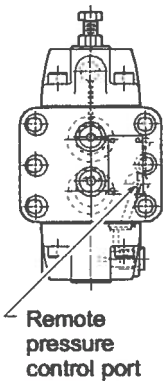
R(C)G Valves

Unloading (RG)



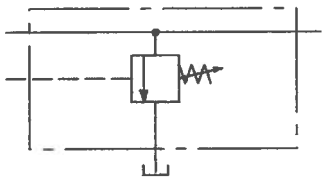
Counterbalance (RCG)



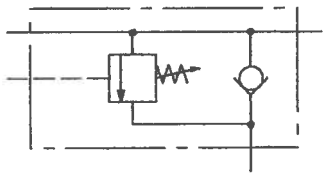


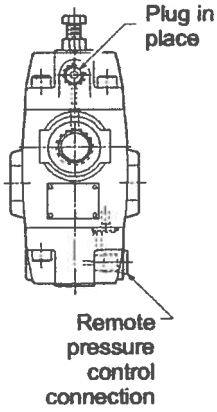
R(C)S/T Valves

Unloading (RS/T)



Counterbalance (RCS/T)





Series URT*-06/10 Unloading Relief Valves

Ratings

Rated Pressure (Maximum)	210 bar (3000 psi)
Rated Capacity (Maximum)	
URT*-06	76 l/min (20 USgpm)
URT*-10	189 l/min (50 USgpm)

Model Code

(F3)U R T 1 - 06 - C(V) - 10

1 2 3 4 5 6 7 8 9

1 Special seals

F3 – For mineral oil and fire resistant fluids
Blank – Omit for standard models

2 Valve function

U – Unloading valve

3 Valve type

R – Pressure control valve

4 Connections

T – NPTF thread*

*Not recommended

5 Drain

1 – Externally drained
2 – Internally drained

6 Valve size

06 – $^3/_4$" pipe
10 – $1^1/_4$" pipe

7 Cutout pressure range

B – 24 to 70 bar (350 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 103 to 210 bar (1500 to 3000 psi)

8 High vent spring

V – Optional high vent spring installed
Blank – Omit if not required

9 Design number

Subject to change. Installation dimensions same for designs 10 through 19.

General Data

These valves are used in oil hydraulic circuits where a pressure regulator is required to automatically unload the pump by diverting the pump delivery to the reservoir, at low pressure, when the accumulator pressure reaches the desired maximum (or "cut out") pressure. When the accumulator pressure drops to the "cut in" pressure (approximately 85% of the desired maximum), the valve directs pump delivery to the accumulator and hydraulic system. The valve may also be used with a double pump to deliver a large volume of oil to the system at low pressure and a small volume at high pressure, serving the same function as an unloading valve. A separate right angle check valve, C2-815 ($^3/_4$") or C2-825 ($1^1/_4$") must be provided to maintain accumulator hydraulic charge or unloading of high volume pump and prevent back flow when pump is unloaded.

Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Installation Data

Tank Drain

Back pressure at the tank discharge port of the URT1 series (externally drained) valves will not effect the operation at up to 85% of the inlet pressure. Back pressure at the tank discharge port of the URT2 series (internally drained) valves must not exceed 5% of the inlet pressure.

CAUTION

For series URT1 only, the drain must be connected to tank through a surge free line so there will be no back pressure at this drain. Failure to connect drain can result in infinite system pressures and machine damage. Series URT2 has internal drain and this port is not used.

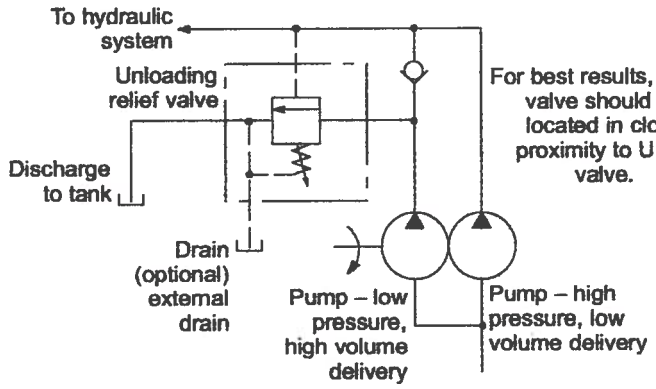
Connections

Pressure inlet and outlet connections are connected by a through passage which permits use of either connection as an inlet.

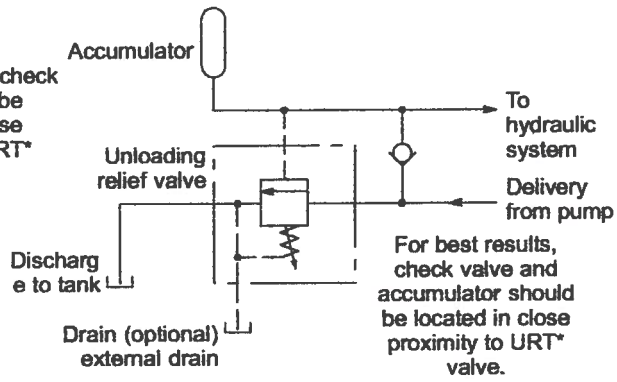
	Approximate Minimum Venting Pressures bar (psi) at Various Percentages of Maximum Rated Capacity			
Model	**25%**	**50%**	**75%**	**100%**
URT*-06-*-10	0,7 (10)	0,8 (11)	1,0 (15)	1,6 (23)
URT*-06-*V-10	3,9 (56)	3,9 (57)	4,1 (59)	4,3 (63)
URT*-10-*-10	0,4 (6)	0,7 (10)	1,6 (23)	2,7 (39)
URT*-10-*V-10	3,6 (52)	3,7 (54)	3,9 (57)	4,1 (59)

Typical Applications

Double Pump Circuit


To hydraulic system
Unloading relief valve
Discharge to tank
Drain (optional) external drain
Pump – low pressure, high volume delivery
Pump – high pressure, low volume delivery
For best results, check valve should be located in close proximity to URT* valve.

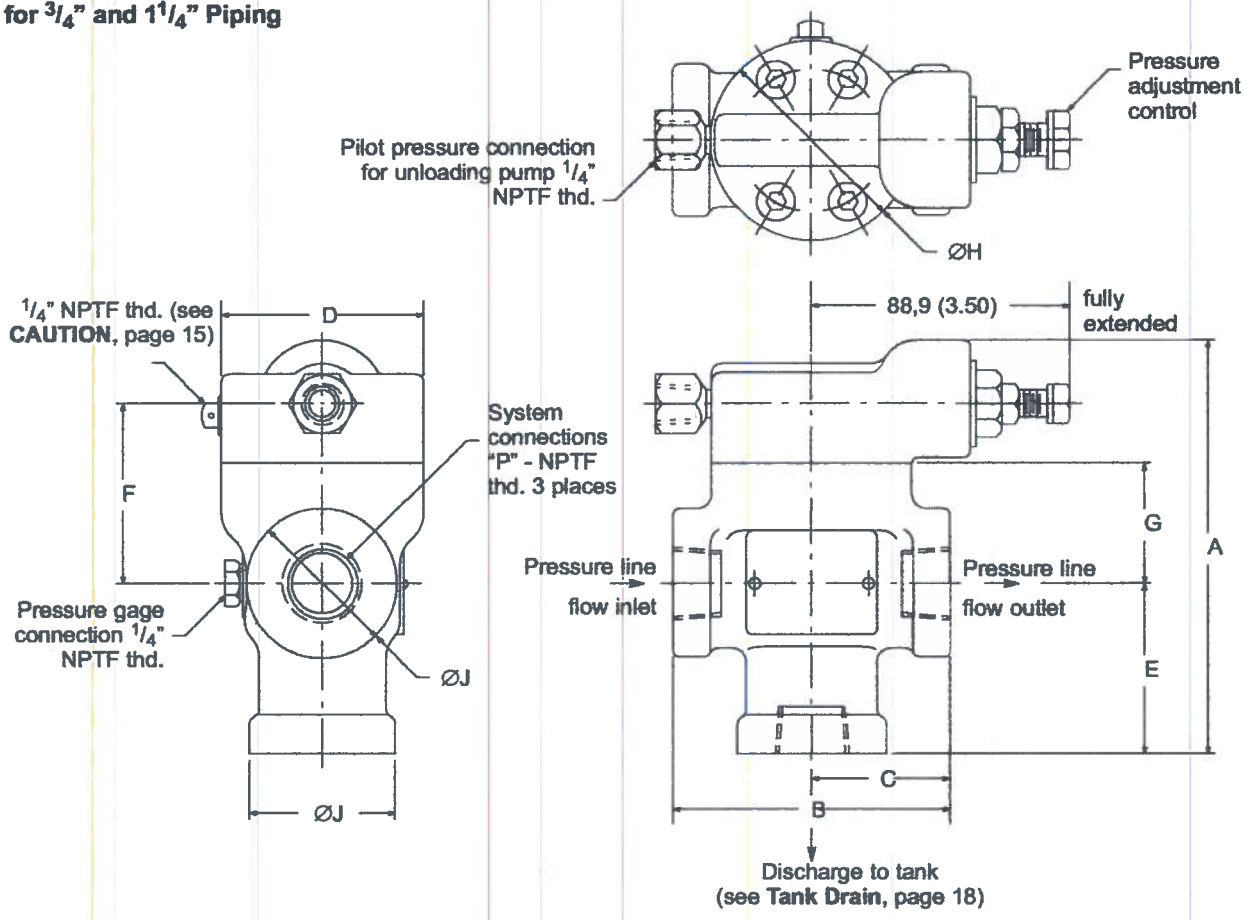
Accumulator Circuit


Accumulator
To hydraulic system
Unloading relief valve
Delivery from pump
Discharg e to tank
Drain (optional) external drain
For best results, check valve and accumulator should be located in close proximity to URT* valve.

Installation Dimensions

Millimeters (inches)

URT1 and URT2 with Threaded Connections for $^{3}/_{4}$" and $1^{1}/_{4}$" Piping



Model	"P" Piping Thd. Size NPTF	Nominal Capacity l/min (USgpm)	A	B	C	D	E	F	G	H	J
URT*-06-*-10	$^{3}/_{4}$"	76 (20)	158,8 (6.25)	108,0 (4.25)	53,8 (2.12)	77,7 (3.06)	65,0 (2.56)	68,3 (2.69)	46,0 (1.81)	76,2 (3.00)	57,2 (2.25)
URT*-10-*-10	$1^{1}/_{4}$"	189 (50)	189,0 (7.44)	127,0 (5.00)	63,5 (2.50)	95,2 (3.75)	77,7 (3.06)	87,4 (3.44)	60,5 (2.38)	95,2 (3.75)	76,2 (3.00)

Series URG*-06/10 Unloading Relief Valves

Ratings

Rated Pressure (Maximum)	210 bar (3000 psi)
Rated Capacity (Maximum)	
URT*-06	95 l/min (25 USgpm)
URT*-10	246 l/min (65 USgpm)

Model Code

(F3)U R G 1 - 06 - C(V) - 10

1 2 3 4 5 6 7 8 9

1 Special seals

F3 – For mineral oil and fire resistant fluids
Blank – Omit for standard models

2 Valve function

U – Unloading valve

3 Valve type

R – Pressure control valve

4 Connections

G – Manifold or subplate mounted

5 Drain

1 – Externally drained
2 – Internally drained

6 Valve size

06 – $^3/_4$" pipe
10 – $1^1/_4$" pipe

7 Cutout pressure range

B – 24 to 70 bar (350 to 1000 psi)
C – 35 to 140 bar (500 to 2000 psi)
F – 103 to 210 bar (1500 to 3000 psi)

8 High vent spring

V – Optional high vent spring installed
Blank – Omit if not required

9 Design number

Subject to change. Installation dimensions same for designs 10 through 19.

General Data

These valves are used in oil hydraulic circuits where a pressure regulator is required to automatically unload the pump by diverting the pump delivery to the reservoir, at low pressure, when the accumulator reaches the desired maximum (or "cut out") pressure. When the accumulator pressure drops to the "cut in" pressure (approximately 85% of the desired maximum), the valve directs pump delivery to the accumulator and hydraulic system. An integral check valve prevents return flow from the accumulator through the unloading valve.

The valve may also be used with a double pump to deliver a large volume of oil to the system at low pressure and a small volume at high pressure, serving the same function as a separate unloading valve and check valve.

Pressure Adjustment

Pressure can be adjusted by loosening a jam nut and turning an adjustment screw. Turning clockwise increases pressure, and turning counterclockwise decreases pressure.

Series URG*-06/10 Unloading Relief Valves

Installation Data

Tank Drain

Back pressure at the tank discharge port of the URG1 series (externally drained) valves will not effect the operation at up to 85% of the inlet pressure. Back pressure at the discharge port of the URG2 series (internally drained) valves must not exceed 5% of the inlet pressure.

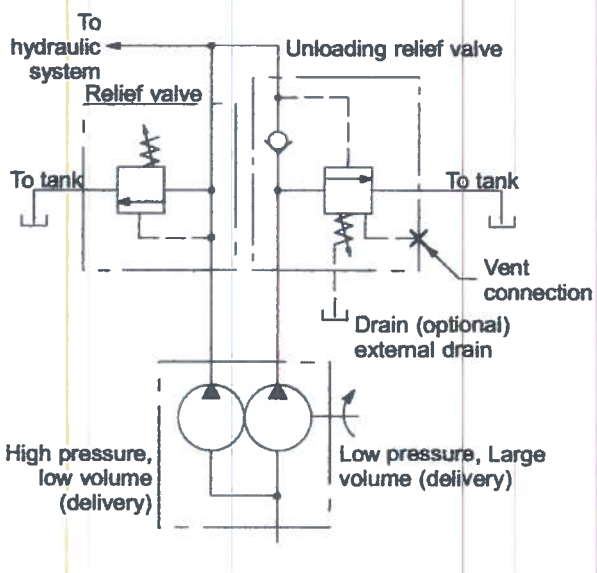
CAUTION

For series URG1 only, the drain must be connected to the tank through a surge free line so there will be no back pressure at this drain. Failure to connect drain can result in infinite system pressures and machine damage. Series URG2 has internal drain and this port is not used.

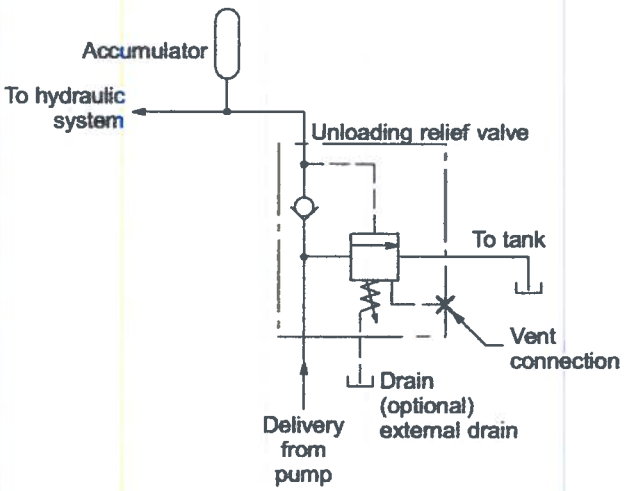
Model	Nominal Capacity l/min (USgpm)	Cut Out Pressure Range bar (psi)	Approximate Pressure Drop bar (psi)	
			Unloading	Via Check To Accumulator
URG*-06-B-10	95 (25)	24 to 70 (350 to 1000)	5,9 (85)	2,4 (35)
URG*-06-C-10		35 to 140 (500 to 2000)		
URG*-06-F-10		103 to 207 (1500 to 3000)		
URG*-10-B-10	246 (65)	24 to 70 (350 to 1000)	2,4 (35)	1,1 (16)
URG*-10-C-10		35 to 140 (500 to 2000)		
URG*-10-F-10		103 to 207 (1500 to 3000)		

Typical Applications

Double Pump Circuit



Accumulator Circuit



Installation Dimensions

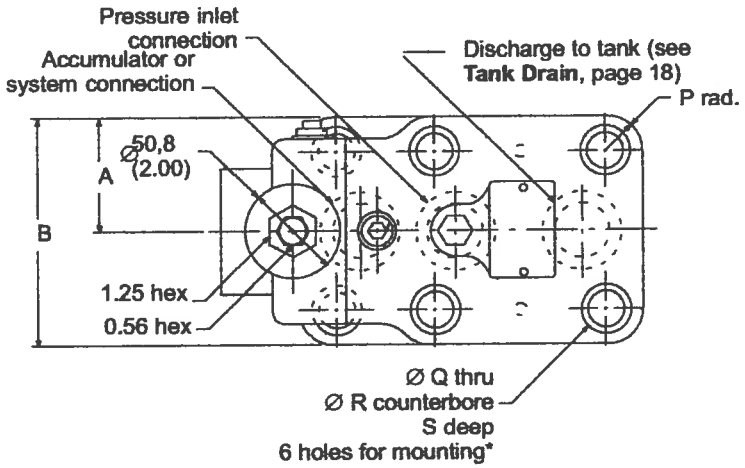
Millimeters (inches)

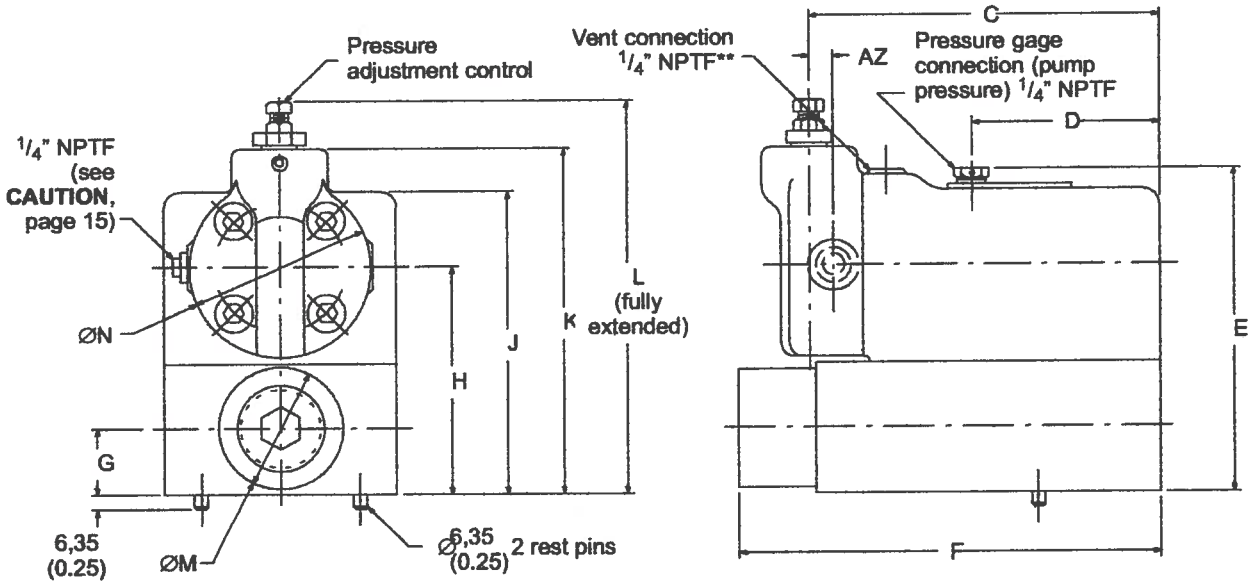
URG*-06/10 Valve

NOTES

* See mounting subplates for locating dimensions.

** Keep plugged except when circuit indicates connection for venting valve.



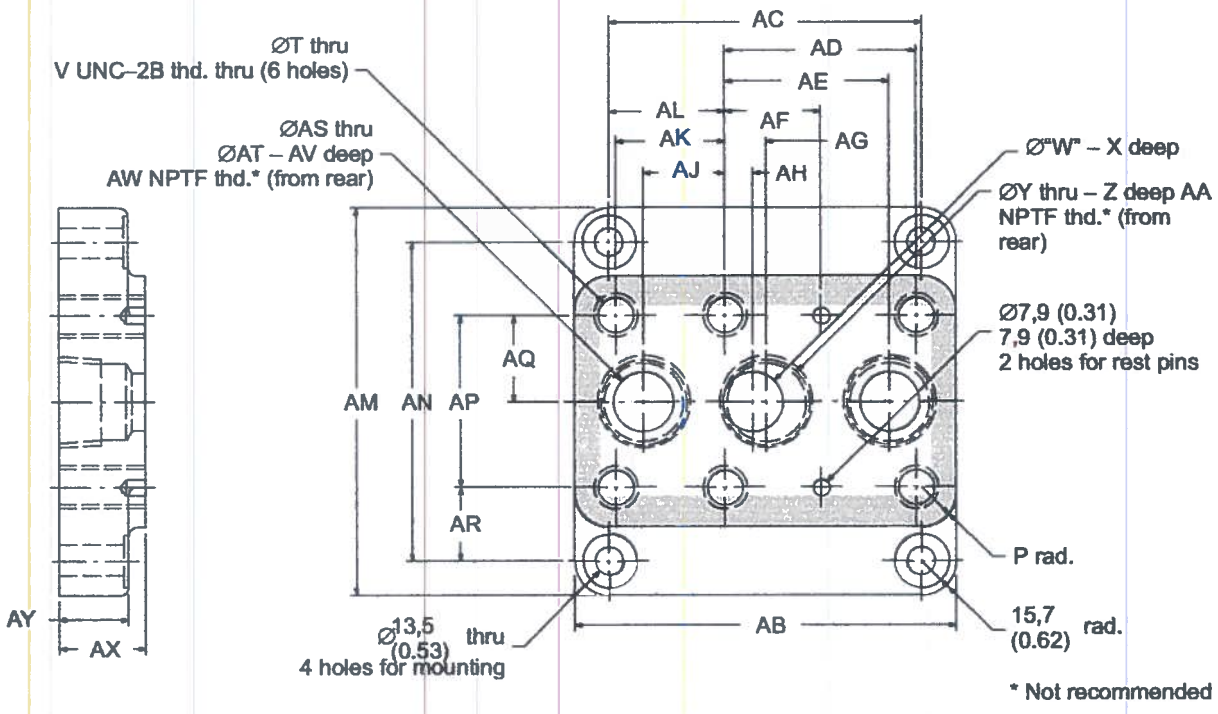


Model	A	B	C	D	E	F	G	H	J
URG*-06-*-10	50,8 (2.00)	101,6 (4.00)	139,7 (5.50)	76,2 (3.00)	134,9 (5.31)	160,3 (6.31)	25,4 (1.00)	91,9 (3.62)	124,0 (4.88)
URG*-10-*-10	60,5 (2.38)	120,6 (4.75)	179,3 (7.06)	95,2 (3.75)	168,1 (6.62)	217,4 (8.56)	33,3 (1.31)	117,3 (4.62)	157,2 (6.19)

Model	K	L	M	N	P	Q	R	S	AZ
URG*-06-*-10	153,9 (6.06)	180,8 (7.12)	44,4 (1.75)	76,2 (3.00)	15,7 (0.62)	16,8 (0.66)	25,4 (1.00)	15,7 (0.62)	3,0 (0.12)
URG*-10-*-10	179,3 (7.06)	206,2 (8.12)	63,5 (2.50)	95,2 (3.75)	19,0 (0.75)	17,8 (0.78)	29,5 (1.16)	19,0 (0.75)	1,5 (0.06)

Series URG*-06/10 Unloading Relief Valves

Mounting Subplates



Model	P	T	V	W	X	Y	Z	AA	AB	AC
URG1M-06-10	15,7 (0.62)	14,0 (0.55)	.625–11	23,1 (0.91)	31,8 (1.25)	—	—	3/4"	144,5 (5.69)	112,71 (4.438)
URG1M-10-10	19,0 (0.75)	16,8 (0.66)	.750–10	28,4 (1.12)	11,2 (0.44)	38,1 (1.50)	30,5 (1.12)	1 1/4"	177,8 (7.00)	146,05 (5.750)

Model	AD	AE	AF	AG	AH	AJ	AK	AL	AM	AN
URG1M-06-10	66,5 (2.62)	55,6 (2.19)	33,3 (1.31)	11,2 (0.44)	10,2 (0.44)	33,3 (1.31)	46,0 (1.81)	46,0 (1.81)	162,1 (6.38)	130,18 (5.125)
URG1M-10-10	88,9 (3.50)	76,2 (3.00)	44,4 (1.75)	19,0 (0.75)	12,7 (0.50)	38,1 (1.50)	50,8 (2.00)	53,8 (2.12)	184,1 (7.25)	152,40 (6.000)

Model	AP	AQ	AR	AS	AT	AV	AW	AX	AY
URG1M-06-10	69,8 (2.75)	35,1 (1.38)	30,2 (1.19)	23,1 (0.91)	—	—	3/4"	31,8 (1.25)	25,4 (1.00)
URG1M-10-10	82,6 (3.25)	41,1 (1.62)	35,1 (1.38)	28,4 (1.12)	38,1 (1.50)	30,2 (1.19)	1 1/4"	38,1 (1.50)	31,8 (1.25)

Series XSL/XTL-03 Pressure Reducing Valves

Ratings

Rated Capacity (Maximum)	30 l/min (8 USgpm)
Adjustable Pressure Range	3,4 to 70 bar (50 to 1000 psi)*
Inlet Pressure (Maximum)	140 bar (2000 psi)

* X*L-03-B-10-S21 model has adjustable pressure range of 1,7 to 21 bar (25 to 300 psi) with maximum inlet pressure of 70 bar (1000 psi).

Model Code

(F3)X T L - 03 - B - 10 - S21

1 2 3 4 5 6 7 8

1 Special seals

F3 – For mineral oil and fire resistant fluids
Blank – Omit for standard models

2 Valve type

X – Pressure reducing valve

3 Connections

S – SAE straight thread
T – NPTF thread*

* Not recommended

4 Pressure level

L – Low pressure type

5 Valve size

03 – $^{3}/_{8}$" pipe

6 Pressure range

B – 3,4 to 70 bar (50 to 1000 psi)

7 Design number

Subject to change. Installation dimensions same for designs 10 through 19.

8 Special feature suffix

S21 – Adjustable pressure range of 1,7 to 21 bar (25 to 300 psi) with maximum inlet pressure of 70 bar (1000 psi)
Blank – Omit if not required

General Data

The operation of these Vickers reducing valves is such that reduced outlet pressure remains constant regardless of variation of inlet pressure above the selected pressure setting. Reverse free flow is allowable, providing the pressure at the reduced pressure port does not exceed the reduced pressure setting of the valve.

Pressure Adjustment

A differential of at least 1,7 bar (25 psi) between inlet and outlet pressure must be maintained for proper functioning.

Adjustment of reduced outlet pressure is accomplished by loosening jam nut and turning pressure adjustment control. Clockwise rotation increases pressure. Counterclockwise rotation decreases pressure. Control adjustment has stops for minimum and maximum pressures.

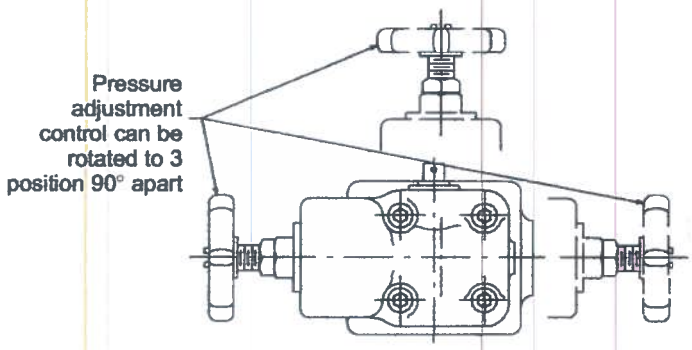
Drain Connection

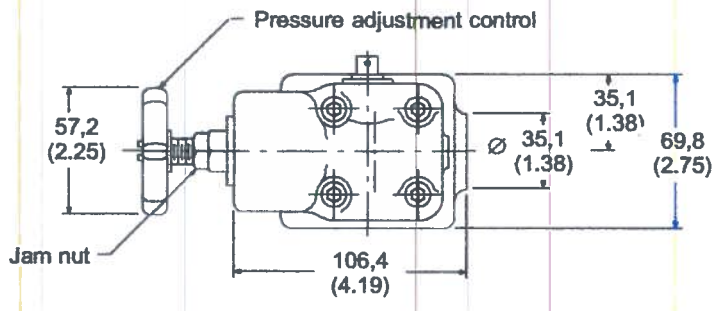
The drain connection must be piped directly to tank. Any pressure at this port must be added to the valve pressure setting.

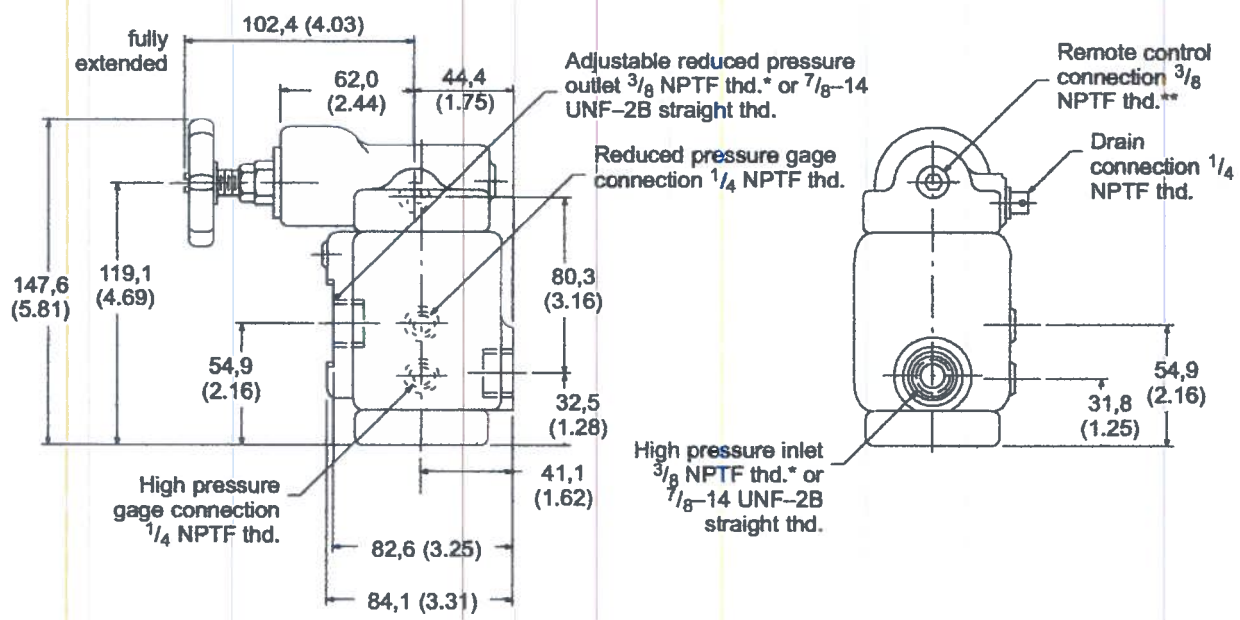
Installation Dimensions

Millimeters (inches)

XS/TL-03-B-10 Valve







NOTES

Model XSL-03-B-10 is supplied with 7/8–14 straight thread system connections and a 9/16–18 straight thread drain connection.

X*L-03-B-10-S21 model has adjustable pressure range of 1,7 to 21 bar (25 to 300 psi) with maximum inlet pressure of 70 bar (1000 psi).

* Not recommended.

** Reduced pressure may be adjusted remotely by connecting this port to pressure inlet port of CGR-02-*-20 valve or C-175-*-10 valve. Pressure setting of main valve must be higher than that of remote control.

Series XGL-03 Pressure Reducing Valves

Ratings

Rated Capacity (Maximum)	30 l/min (8 USgpm)
Adjustable Pressure Range	1,7 to 70 bar (25 to 1000 psi)
Inlet Pressure (Maximum)	140 bar (2000 psi)

Model Code

(F3)X G L - 03 - B - 10

1 2 3 4 5 6 7

1 Special seals

F3 – For mineral oil and fire resistant fluids

Blank – Omit for standard models

2 Valve type

X – Pressure reducing valve

3 Connections

G – Manifold or subplate mounting

4 Pressure level

L – Low pressure type

5 Valve size

03 – $^3/_8$" nominal size

6 Pressure range

B – 1,7 to 70 bar (25 to 1000 psi)

7 Design number

Subject to change. Installation dimensions same for designs 10 through 19.

General Data

The operation of these reducing valves is such that reduced outlet pressure remains constant regardless of variation of inlet pressure above the selected pressure setting. Reverse free flow is allowable, providing the pressure at the reduced pressure port does not exceed the reduced pressure setting of the valve.

Pressure Adjustment

A differential of at least 1,7 bar (25 psi) between inlet and outlet pressure must be maintained for proper functioning.

Adjustment of reduced outlet pressure is accomplished by loosening jam nut and turning pressure adjustment control. Clockwise rotation increases pressure. Counterclockwise rotation decreases pressure. Control adjustment has stops for minimum and maximum pressures.

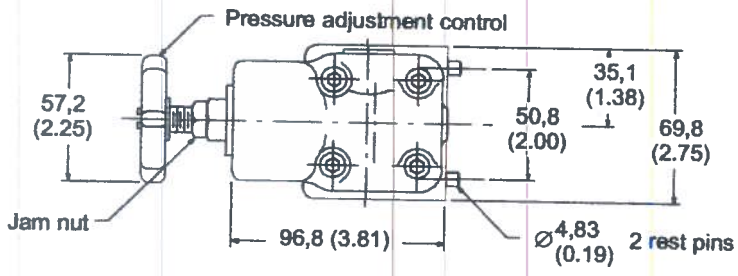
Drain Connection

The drain connection must be piped directly to tank. Any pressure at this port must be added to the valve pressure setting.

Installation Dimensions

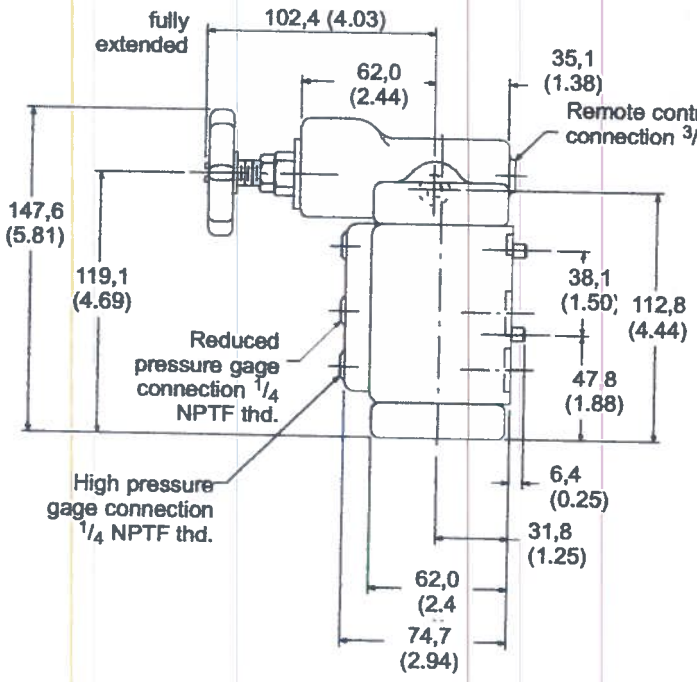
Millimeters (inches)

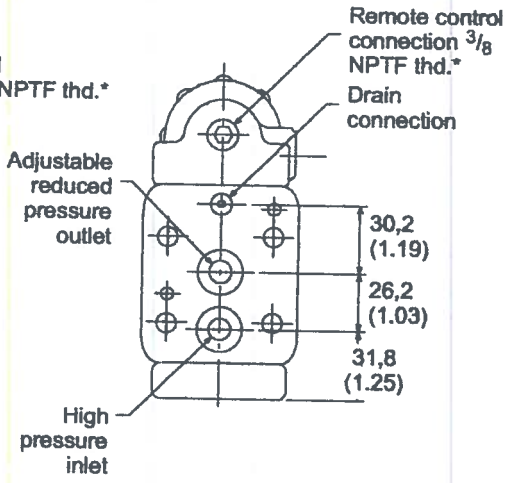
XGL-03-B-10 Valve



NOTE

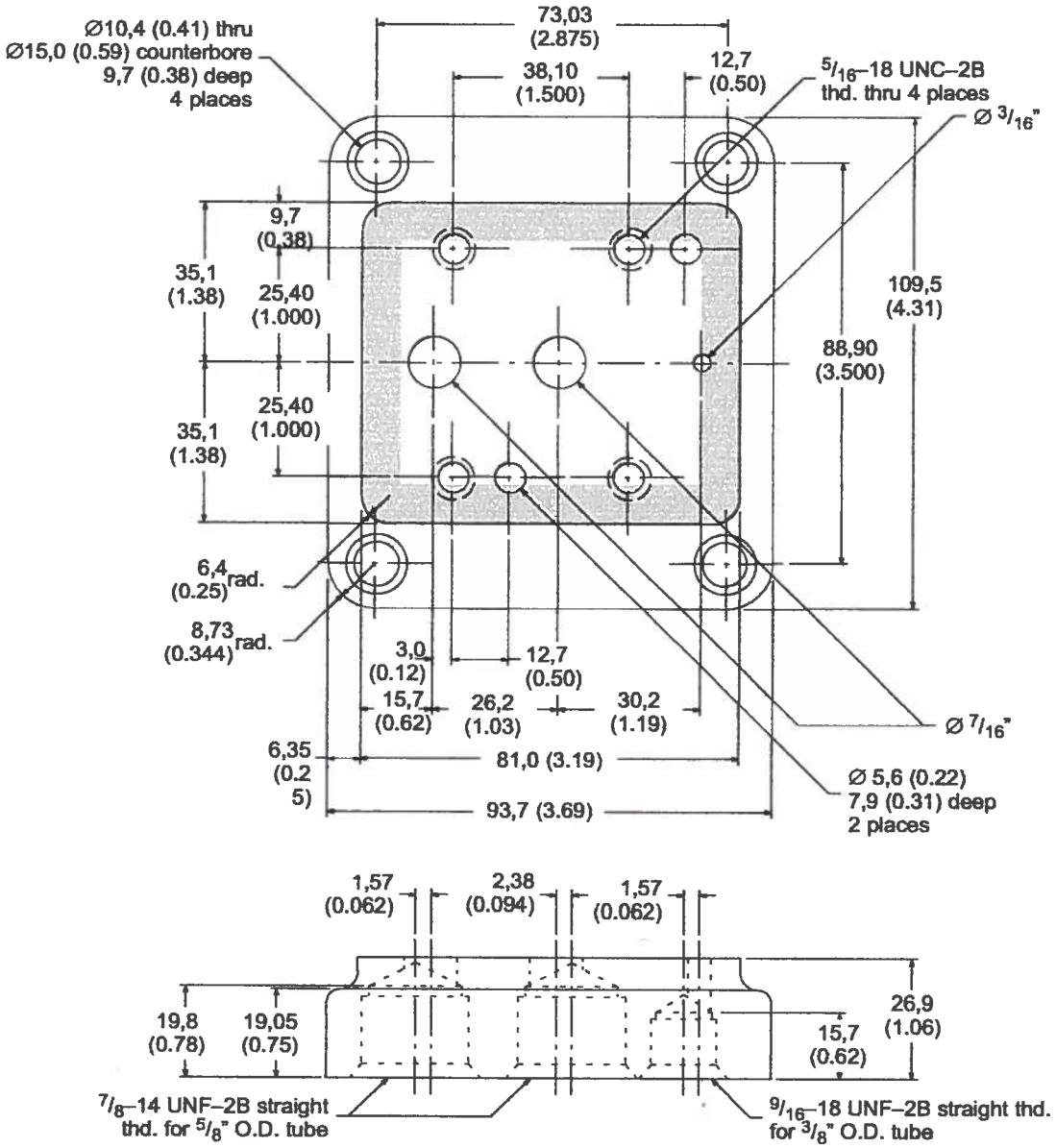
* Reduced pressure may be adjusted remotely by connecting this port to pressure inlet port of CGR-02-*-20 valve or C-175-*-10 valve. Pressure setting of main valve must be higher than that of remote control.





Mounting Subplate

Model XGLM-10S-03-10



Series X(C)*-03/06/10 Pressure Reducing Valves

Ratings

Rated Capacity (Maximum)	530 l/min (140 USgpm)
Inlet Pressure (Maximum)	210 bar (3000 psi)

Model Code

(F3)X(C) * -(H) 06 - 2 B - 30

1 2 3 4 5 6 7 8 9

1 Special seals

F3 – For mineral oil and fire resistant fluids
Blank – Omit for standard models

2 Valve type

X – Pressure reducing valve

3 Integral check valve

C – Reverse free flow check

4 Connections

G – Manifold or subplate mounting
S – SAE straight thread
T – NPTF thread*

* Not recommended

5 High-flow designation

H – High-flow valve

Size	Flow l/min (USgpm)
03	114 (30)
06	265 (70)
10	530 (140)

Blank – Omit for 'B' and 'F' models

6 Valve size

03 – $^3/_8$" pipe or 0.7500-16 UNF-2B straight thread (0.500 tubing)
06 – $^3/_4$" pipe or 1.0625-12 UN-2B straight thread (0.750 tubing)
10 – $1^1/_4$" pipe or 1.6250-12 UN-2B straight thread (1.250 tubing)

7 Maximum adjustable pressure

1 – 70 bar (1000 psi)
2 – 140 bar (2000 psi)
3 – 210 bar (3000 psi)*

* 10,3 bar (150 psi) pressure drop across valve minimum recommended. Not available with 'B' flow capacity.

8 Maximum rated flow capacity

B* –

Size	Flow l/min (USgpm)
03	26,5 (7)
06	57 (15)
10	189 (50)

F –

Size	Flow l/min (USgpm)
03	53 (14)
06	114 (30)
10	284 (75)

Blank – Omit for 'H' high-flow models

* Not available with '3' maximum adjustable pressure.

9 Design number

Subject to change. Installation dimensions same for designs 30 through 39.

General Data

The operation of these reducing valves is such that reduced outlet pressure remains constant regardless of variation of inlet pressure above the selected pressure setting. Reverse free flow from "reduced pressure outlet" connection to "high pressure inlet" connection is provided by optional integral check valve.

Pressure Adjustment

A differential of at least 10,3 bar (150 psi) between inlet and outlet pressure must be maintained for proper functioning.

Contact your Vickers representative if maximum inlet pressure is needed with minimum rated reduced pressure.

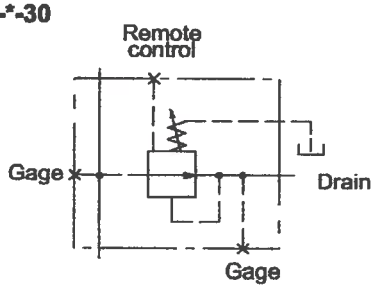
Adjustment of reduced outlet pressure is accomplished by loosening jam nut and turning pressure adjustment control. Clockwise rotation increases pressure. Counterclockwise rotation decreases pressure. Control adjustment has stops for minimum and maximum pressures.

Drain Connection

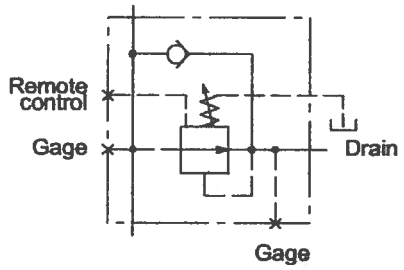
The drain connection must be piped directly to tank through a surge free line. Any continuous drain line pressure must be known and that value added to the valve pressure setting.

Graphical Symbols

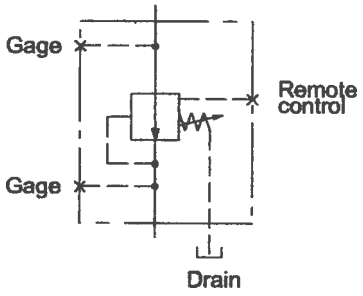
XS--*-30**



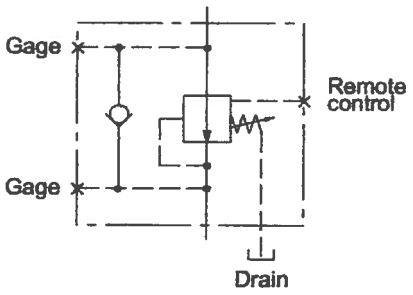
XCS--*-30**



XG--*-30**



XCG--*-30**



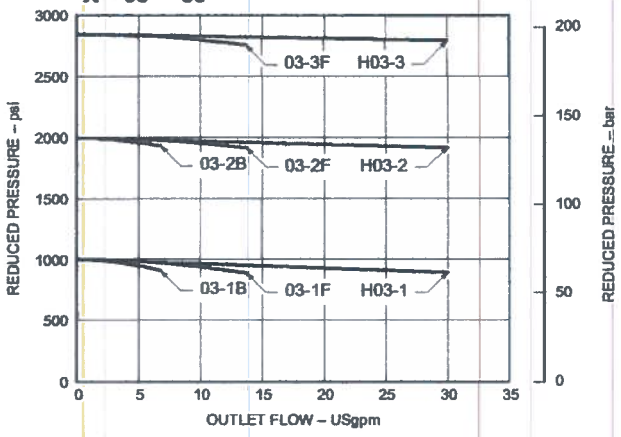
Performance Curves

Based on fluid with specific gravity of 0.865 and viscosity of 20 cSt (100 SUS)

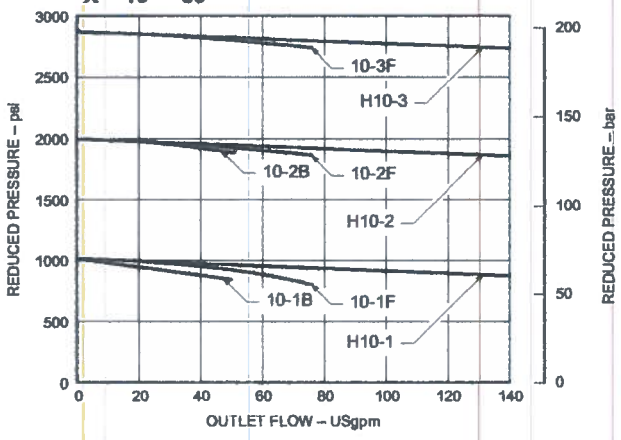
Outlet Pressure vs. Flow

210 bar (3000 psi) inlet

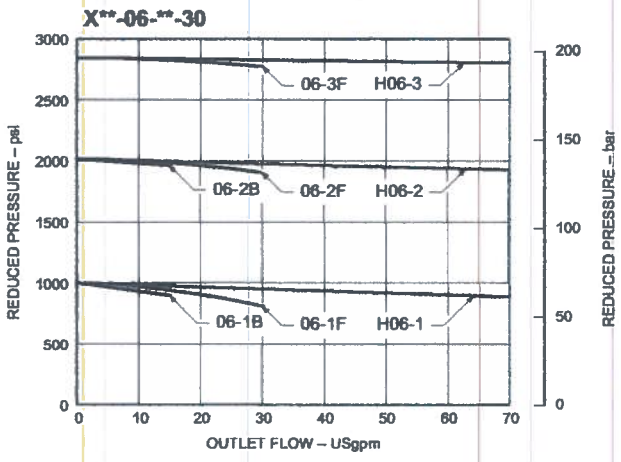
X-03-**-30**



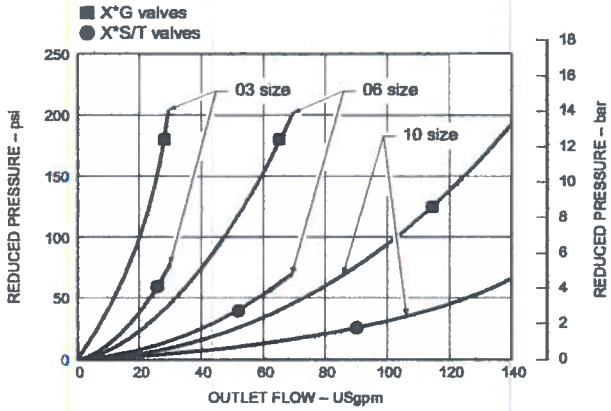
X-10-**-30**



X-06-**-30**

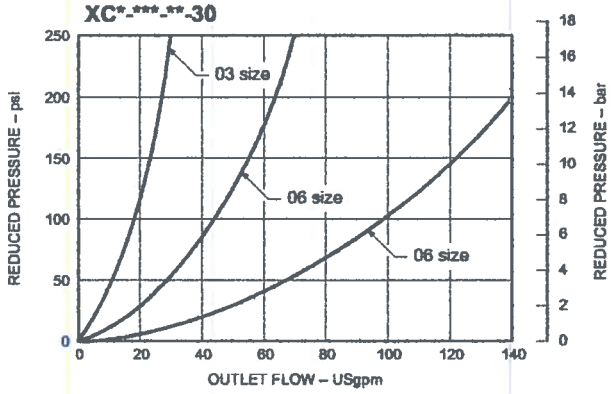


Valve Pressure Drop vs. Flow

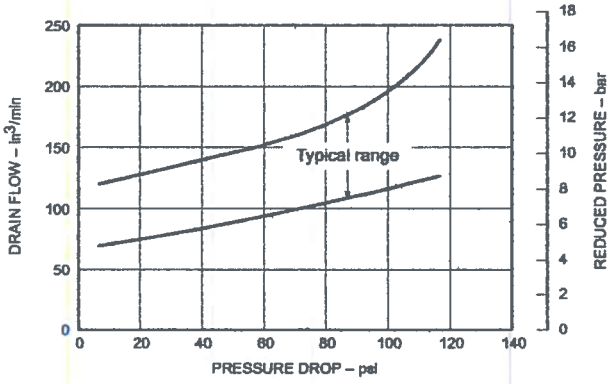


Check Valve Pressure Drop vs. Reverse Free Flow

XC*-*-**-30**

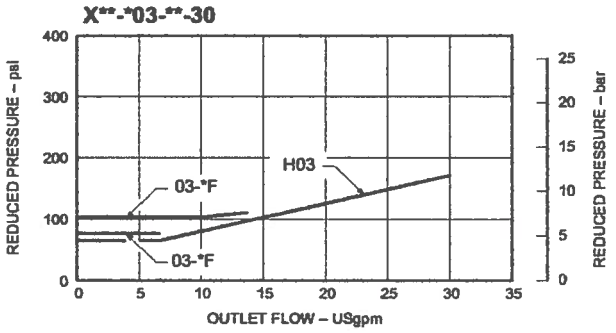


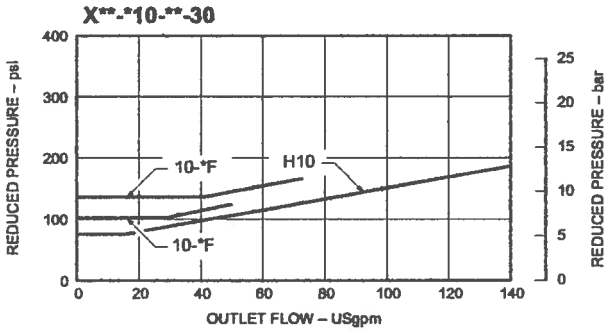
Drain (Control) Flow vs. Valve Pressure Drop (Inlet–Outlet) at Any Flow Condition

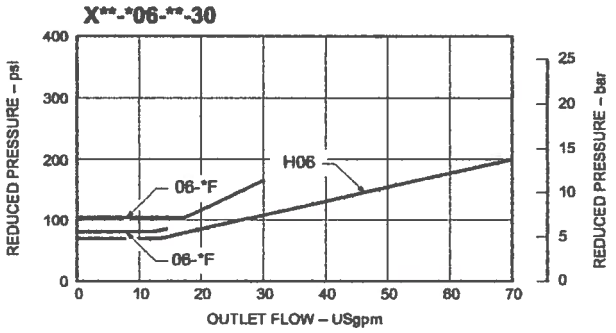


Minimum Adjustable Pressure vs. Flow

140 bar (2000 psi) inlet





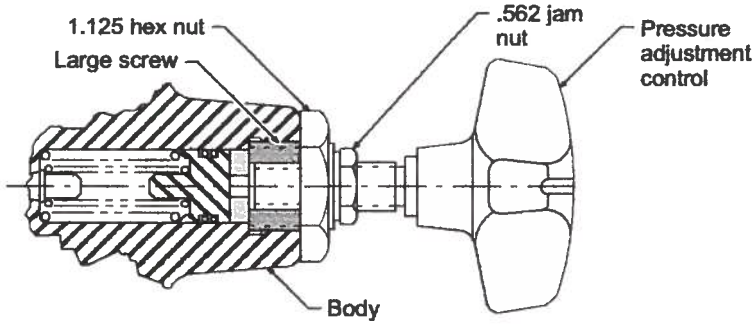


Valve Pressure Adjustment

Maximum pressure for each specific pressure range is pre-set at the factory with the large screw and held in place by the 1.125 hex nut.

Sensitivities for the different pressure ranges are: a)185 psi/rev for 1000 psi max. pressure (5.4 turns total); b) 295 psi/rev for 2000 psi max. pressure (6.8 turns total); and c) 485 psi/rev for 3000 psi max. pressure (6.2 turns total). To lower the maximum pressure:

1. Start large screw approximately 2 to 3 turns into body, then assemble 1.125 hex nut, pressure adjustment control, and .562 jam nut.
2. Turn pressure adjustment control all the way in so .562 jam nut and pressure adjustment control head are tight against end of large screw.
3. With 1.125 hex nut backed-off for clearance, continue turning pressure adjustment control (with large screw locked to it) until desired maximum pressure is reached.
4. Tighten 1.125 hex nut against body to lock maximum pressure setting in place.
1. Back out pressure adjustment control to desired working pressure and lock in place with .562 jam nut.

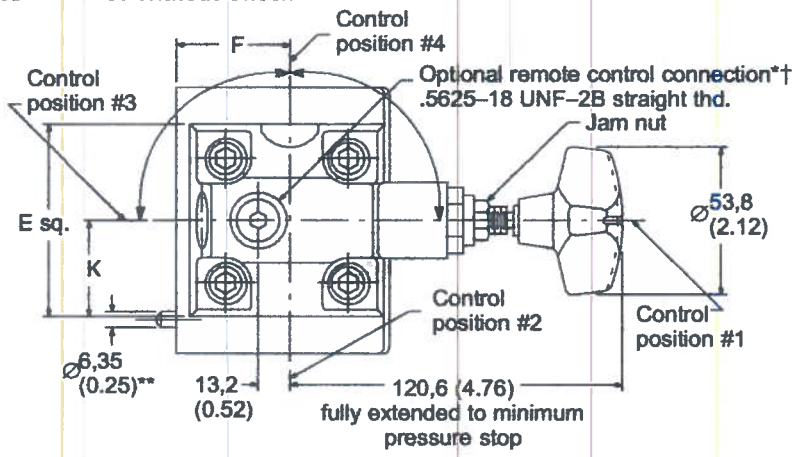


Installation Dimensions

Millimeters (inches)

Subplate or Manifold Mounted Models

XG- * * - * -30 Without Check



NOTES

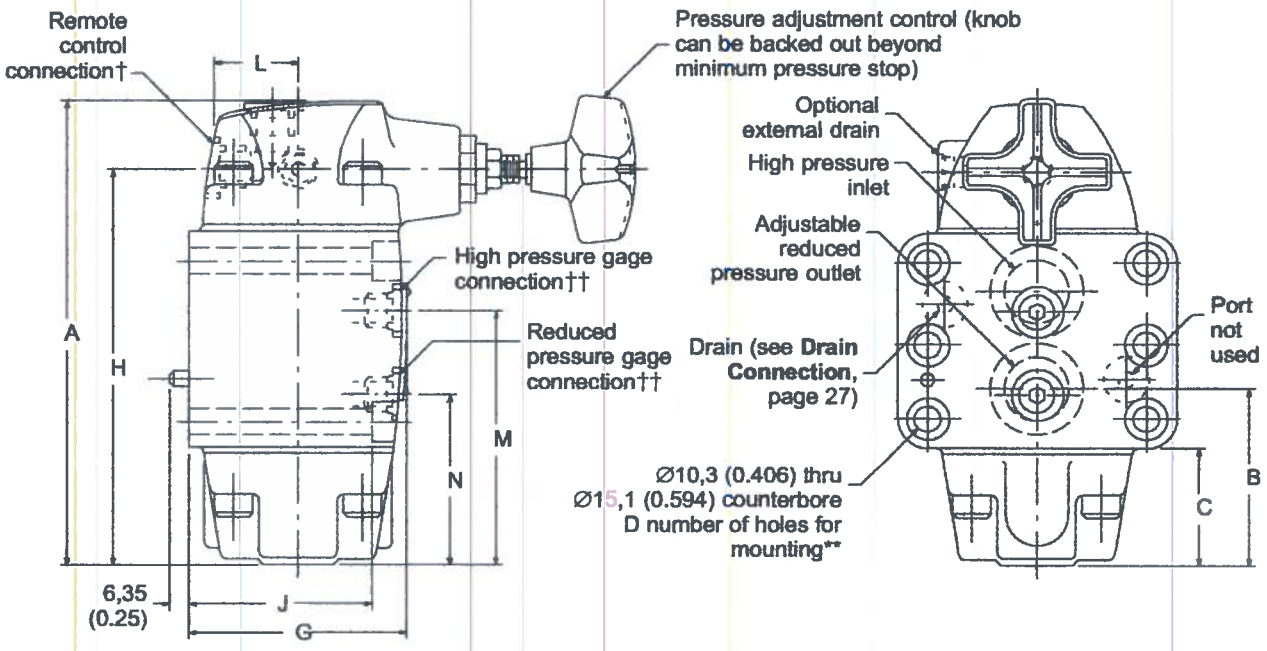
Optional adjustment control positions obtained by rotating cover assembly. Position #1 is standard. Position #2 cannot be used. Position #3 can be used (if it does not interfere with the manifold) providing that the external drain in the cover is connected.

* Available with "(H)06" and "(H)10" models only.

** See mounting subplates for locating dimensions.

† .5625-18 UNF-2B straight thread. Reduced pressure may be adjusted remotely by connecting this port to pressure inlet port of CGR-02-*-20 valve or C-175-*-10 valve. Pressure setting of main valve must be higher than that of remote control.

†† .4375-20 UNF-2B straight thread.

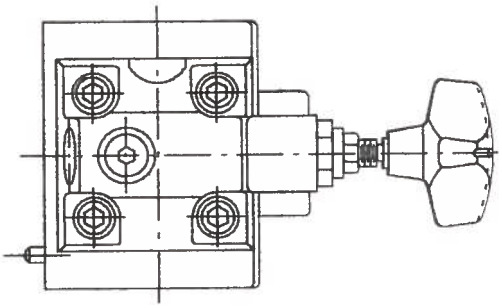


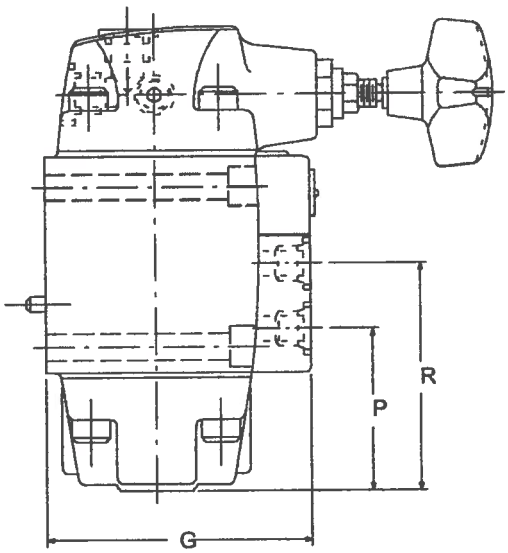
Model	A	B	C	D	E	F	G	H	J	K	L	M	N	NFPA Interface
X(C)G-03-*-30	142,2 (5.60)	46,7 (1.84)	29,5 (1.16)	4	57,2 (2.25)	36,6 (1.44)	68,1 (2.68)	116,8 (4.60)	55,9 (2.20)	28,4 (1.12)	24,6 (0.97)	66,0 (2.60)	41,9 (1.65)	P03
X(C)G-06-*-30	176,5 (6.95)	66,8 (2.63)	44,7 (1.76)	4	71,4 (2.81)	41,1 (1.62)	79,2 (3.12)	151,1 (5.95)	68,6 (2.70)	35,8 (1.41)	29,5 (1.16)	96,8 (3.81)	65,0 (2.56)	P06
X(C)G-10-*-30	211,3 (8.32)	71,4 (2.81)	44,7 (1.76)	6	95,2 (3.75)	50,8 (2.00)	100,1 (3.94)	182,6 (7.19)	90,2 (3.55)	47,8 (1.88)	41,4 (1.63)	101,6 (4.00)	72,4 (2.85)	P10

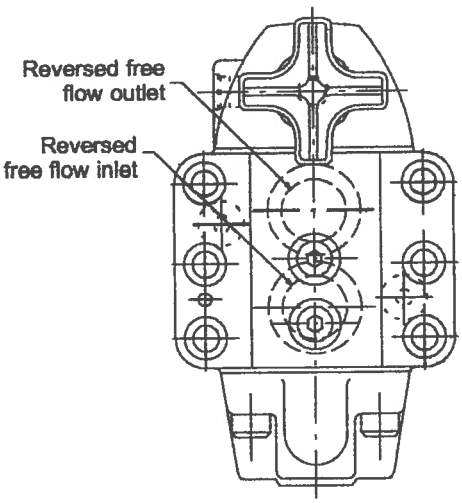
Subplate or Manifold Mounted Models (continued)

XCG- * * - * -30 With Check

(See previous page for other details and dimensions)



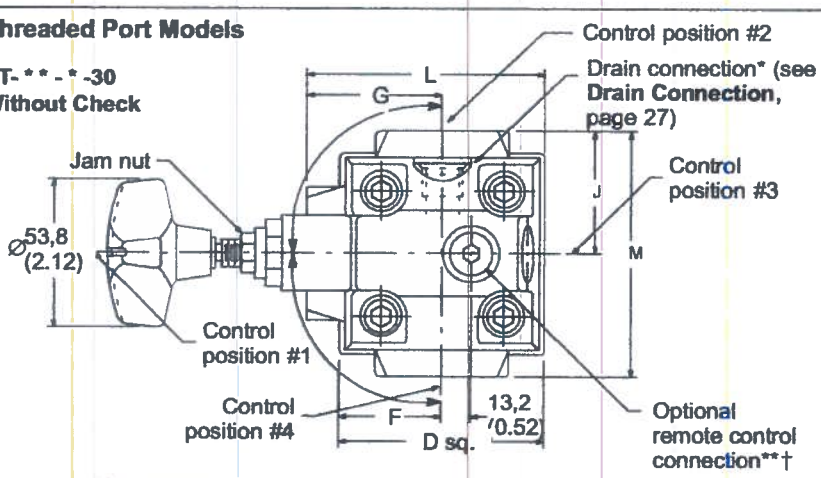


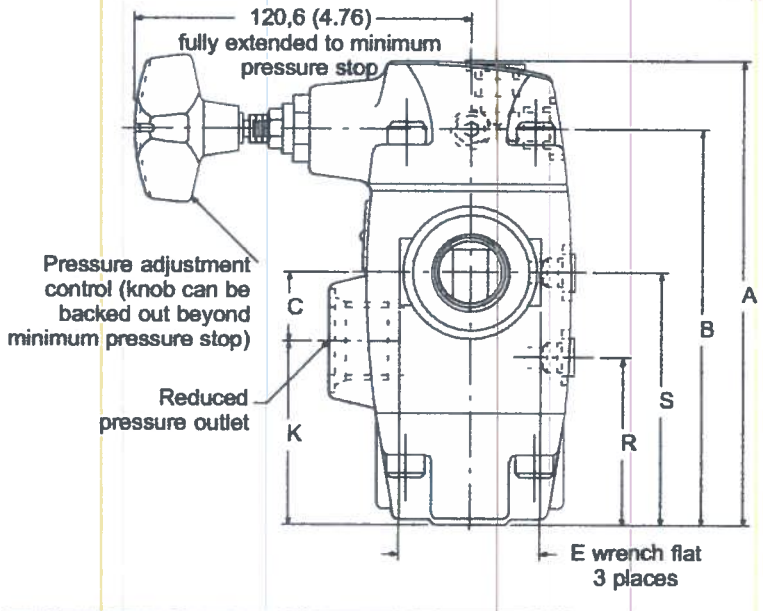


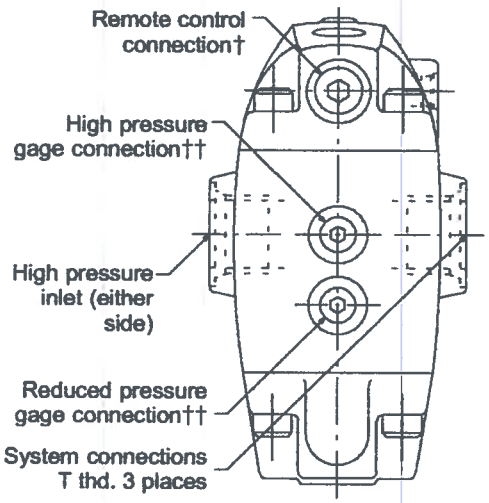
Model	G	P	R
XCG-03-*-30	90,4 (3.56)	41,9 (1.65)	66,0 (2.60)
XCG-06-*-30	98,6 (3.88)	59,7 (2.35)	85,9 (3.38)
XCG-10-*-30	130,3 (5.13)	72,4 (2.85)	101,6 (4.00)

Threaded Port Models

XT--*-30**
Without Check






Remote control connection†
High pressure gage connection††
High pressure inlet (either side)
Reduced pressure gage connection††
System connections T thd. 3 places

NOTES

Optional adjustment control positions obtained by rotating cover assembly. Position #1 is standard. Position #2 cannot be used on XS/T-10 models. Position #3 cannot be used.

* .5625-18 UNF-2B straight thread.

** Available with "(H)06" and "(H)10" models only.

† .5625-18 UNF-2B straight thread. Reduced pressure may be adjusted remotely by connecting this port to pressure inlet port of CGR-02-*-20 valve or C-175-*-10 valve. Pressure setting of main valve must be higher than that of remote control.

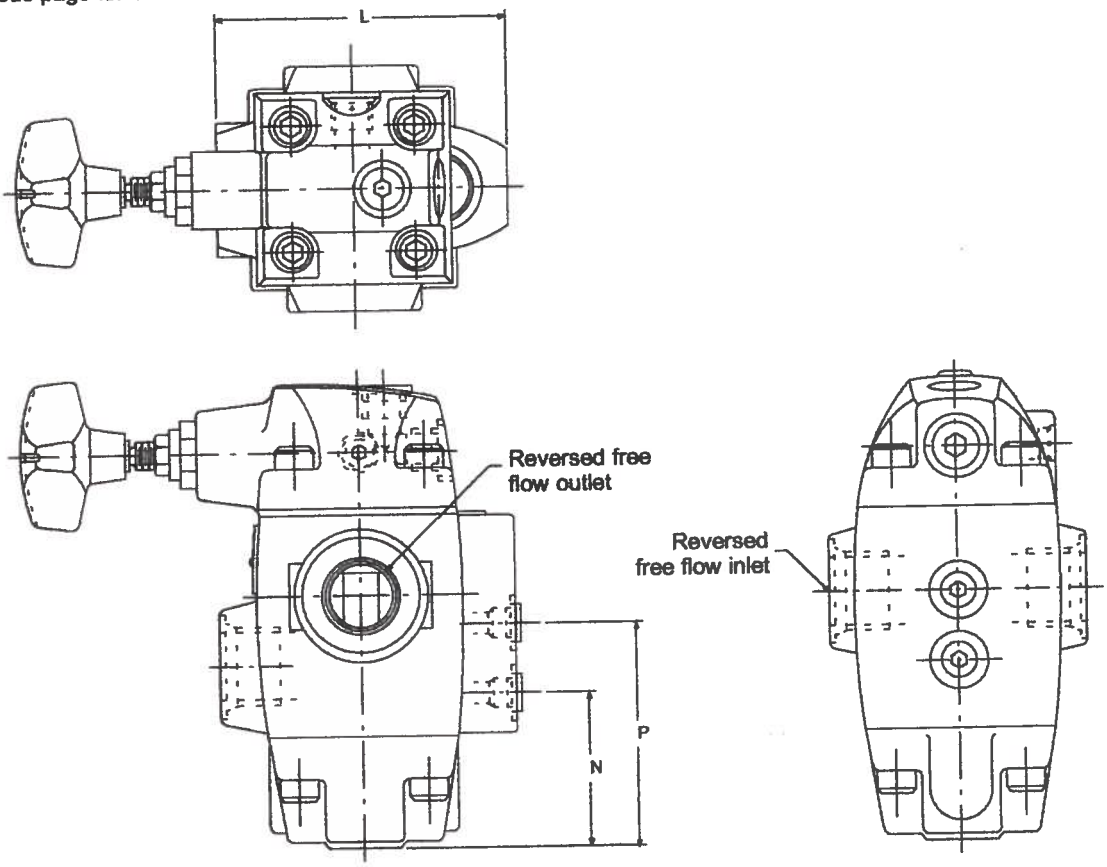
†† .4375-20 UNF-2B straight thread.

Model	A	B	C	D	E	F	G	H	J
X(C)S/T-03-*-30	142,2 (5.60)	116,8 (4.60)	23,1 (0.91)	59,4 (2.34)	35,1 (1.38)	29,7 (1.17)	39,6 (1.56)	24,6 (0.97)	35,1 (1.38)
X(C)S/T-06-*-30	176,5 (6.95)	151,1 (5.95)	26,9 (1.06)	74,7 (2.94)	50,8 (2.00)	37,3 (1.47)	50,8 (2.00)	29,5 (1.16)	47,8 (1.88)
X(C)S/T-10-*-30	211,3 (8.32)	182,6 (7.19)	28,4 (1.12)	98,6 (3.88)	86,4 (3.40)	49,3 (1.94)	68,3 (2.69)	41,4 (1.63)	53,8 (2.12)

Model	K	L	M	R	S	T – for X(C)S models	T – for X(C)T models
X(C)S/T-03-*-30	46,0 (1.81)	70,9 (2.79)	69,9 (2.75)	41,9 (1.65)	66,0 (2.60)	.7500–16 UNF–2B str thd. ($^1/_2$" O.D. tubing)	$^3/_8$" NPTF thd.■
X(C)S/T-06-*-30	69,8 (2.75)	88,1 (3.47)	95,3 (3.75)	65,0 (2.56)	96,8 (3,81)	1.0625–12 UNF–2B strr thd. ($^3/_4$" O.D. tubing)	$^3/_4$" NPTF thd.■
X(C)S/T-10-*-30	81,0 (3.19)	117,3 (4.62)	108,0 (4.25)	72,4 (2.85)	101,6 (4.00)	1.6250–12 UNF–2B strr thd. ($1^1/_4$" O.D. tubing)	$1^1/_4$" NPTF thd.■

■ Not recommended

Threaded Port Models (continued)
XCS/T--*-30 With Check**
(See previous page for other details and dimensions)

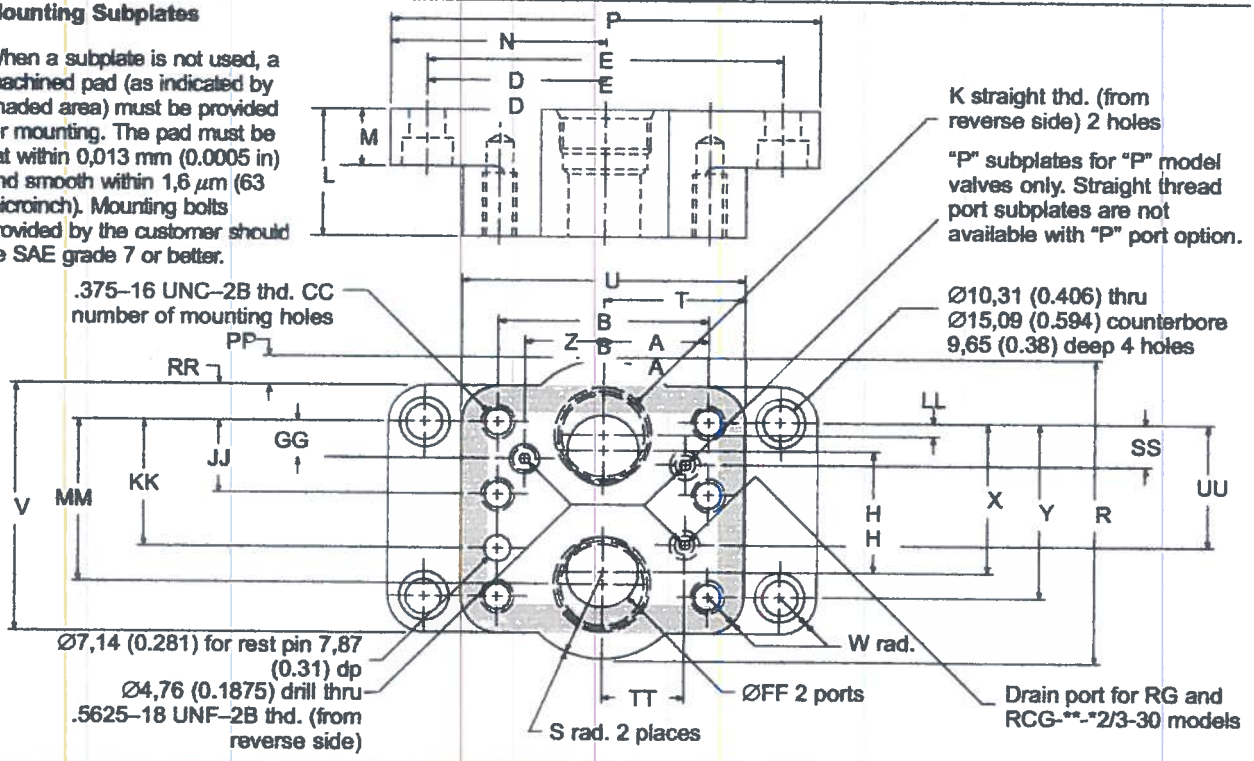


Model	L	N	P
XCS/T-03-*-30	93,7 (3.69)	41,9 (1.65)	66,0 (2.60)
XCS/T-06-*-30	108,0 (4.25)	59,7 (2.35)	84,6 (3.33)
XCS/T-10-*-30	147,6 (5.81)	72,4 (2.85)	101,6 (4.00)

Series X(C)*-03/06/10 Pressure Reducing Valves

Mounting Subplates

When a subplate is not used, a machined pad (as indicated by shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.



Model	K	Tube O.D.	L	M	N	P	R	S	T	U	V
RXGM-03S-(P)-20	.7500–16 UNF–2B	1/2"	25,4 (1.00)	19,0 (0.75)	63,5 (2.50)	127,0 (5.00)	76,2 (3.00)	23,9 (0.94)	43,7 (1.72)	87,4 (3.44)	63,5 (2.50)
RXGM-06SX-(P)-20	1.3125–12 UN–2B	1"	31,8 (1.25)	19,0 (0.75)	73,2 (2.88)	146,0 (5.75)	117,3 (4.62)	39,6 (1.56)	50,8 (2.00)	101,6 (4.00)	82,6 (3.25)
RXGM-10S-(P)-30	1.6250–12 UN–2B	1 1/4"	47,8 (1.88)	22,4 (0.88)	79,2 (3.12)	158,8 (6.25)	146,0 (5.75)	47,8 (1.88)	58,7 (2.31)	117,3 (4.62)	104,6 (4.12)

Model	W	X	Y (±0.005) ±0,13	Z	AA	BB	CC	DD	EE(±0.005) ±0,013	FF	GG
RXGM-03S-(P)-20	10,4 (0.41)	35,8 (1.41)	42,87 (1.688)	25,4 (1.00)	33,3 (1.31)	66,5 (2.62)	4	53,1 (2.09)	106,37 (4.188)	14,2 (0.56)	21,3 (0.84)
RXGM-06SX-(P)-20	10,2 (0.44)	49,3 (1.94)	60,32 (2.375)	33,3 (1.31)	39,6 (1.56)	79,2 (3.12)	4	62,0 (2.44)	123,82 (4.875)	23,1 (0.91)	20,6 (0.81)
RXGM-10S-(P)-30	10,4 (0.41)	67,6 (2.66)	84,12 (3.312)	44,4 (1.75)	48,5 (1.91)	96,8 (3.81)	6	69,1 (2.72)	138,12 (5.438)	28,4 (1.12)	24,6 (0.97)

Model	HH	JJ■	KK	LL	MM	PP	RR	SS	TT	UU	NFPA Interface
RXGM-03S-(P)-20	28,4 (1.12)	—	31,8 (1.25)	4,8 (0.19)	38,1 (1.50)	6,4 (0.25)	10,4 (0.41)	—	25,4 (1.00)	21,3 (0.84)	P03
RXGM-06SX-(P)-20	38,1 (1.50)	—	44,4 (1.75)	6,4 (0.25)	53,8 (2.12)	17,5 (0.69)	11,2 (0.44)	16,8 (0.66)	33,3 (1.31)	39,6 (1.56)	P06
RXGM-10S-(P)-30	50,8 (2.00)	42,2 (1.66)	62,7 (2.47)	7,9 (0.31)	76,2 (3.00)	20,6 (0.81)	10,4 (0.41)	24,6 (0.97)	44,4 (1.75)	59,4 (2.34)	P10

■ RXGM-03S/06SX require 4 valve mounting screws. RXGM-10S requires 6 valve mounting screws.

Weights

The following table lists the approximate weight of each valve in the catalog:

Valve	Weight kg (lbs)
RS/T-03-*-30	2,7 (6.0)
RS/T-06-*-30	5,7 (12.5)
RS/T-10/12-*-30	12,0 (26.5)
RCS/T-03-*-30	2,9 (6.5)
RCS/T-06-*-30	5,9 (13.0)
RCS/T-10/12-*-30	12,9 (28.5)
RG-03-*-30	3,6 (8.0)
RG-06-*-30	6,4 (14.0)
RG-10/12-*-30	11,8 (26.0)
RCG-03-*-30	3,9 (8.5)
RCG-06-*-30	6,6 (14.5)
RCG-10/12-*-30	12,7 (28.0)
URT*-06-*-10	4,5 (10.0)
URT*-10-*-10	9,1 (20,0)
URG*-06-*-10	11,3 (25.0)
URG*-10-*-10	22,0 (48.5)
XS/TL-03-B-10	4,1 (9.0)
XGL-03-B-10	4,1 (9.0)
XG-03-*-30	3,9 (8.5)
XG-06-*-30	6,1 (13.5)
XG-10-*-30	11,8 (26.0)
XCG-03-*-30	4,1 (9.0)
XCG-06-*-30	6,4 (14.0)
XCG-10-*-30	12,2 (27.0)
XS/T-03-*-30	3,2 (7.0)
XS/T-06-*-30	5,7 (12.5)
XS/T-10-*-30	11,3 (25.0)
XCS/T-03-*-30	3,4 (7.5)
XCS/T-06-*-30	5,9 (13.0)
XCS/T-10-*-30	11,8 (26.0)

The following table lists the approximate weight of each subplate in the catalog:

Subplate	Weight kg (lbs)
RXGM-03S-20	1,5 (3.25)
RXGM-06SX-20	2,9 (6.50)
RXGM-10S-30	5,0 (11.00)
URG1M-06-10	5,7 (12.5)
URG1M-10-10	9,3 (20.5)
XGLM-10S-03-10	1,4 (3.0)

Fluids and Seals

For best results, oil viscosity should range between 32 cSt and 49 cSt (150 SUS and 225 SUS) at 38°C (100°F) with a maximum operating temperature of 68°C (155°F). Water glycol, water-in-oil emulsions, and petroleum oil may be used with non-F3 models, which are furnished with Buna-N seals for the mounting surface and fluorocarbon seals internally. Add F3 prefix when phosphate ester type fluids or blends are to be used. Refer to 694 for hydraulic fluid and temperature recommendations.

The use of synthetic, fire-resistant fluids requires a valve with special seals.

Subplates and Bolt Kits

Valves, subplates, and mounting bolts must be ordered separately.

Example:
(1) URG*-06-12 valve
(1) URG1M-06-10 subplate
(1) BKUR06682 bolt kit (consisting of two bolts, $^5/_8$–11 x 2.50", and four bolts, $^5/_8$–11 x 5.25")

The following table lists the appropriate subplate for use with each manifold or subplate mounted valve in the catalog:

Valve	Subplate
RG-03-*-30	RXGM-03S-20
RG-06-*-30	RXGM-06SX-20
RG-10/12-*-30	RXGM-10S-30
RCG-03-*-30	RXGM-03S-20
RCG-06-*-30	RXGM-06SX-20
RCG-10/12-*-30	RXGM-10S-30
URG*-06-*-10	URG1M-06-10
URG*-10-*-10	URG1M-10-10
XGL-03-B-10	XGLM-10S-03-10
XG-03-*-30	RXGM-03S-20
XG-06-*-30	RXGM-06SX-20
XG-10-*-30	RXGM-10S-30
XCG-03-*-30	RXGM-03S-20
XCG-06-*-30	RXGM-06SX-20
XCG-10-*-30	RXGM-10S-30

The following table lists the appropriate bolt kit for each subplate mounted valve in the catalog:

Valve	Bolt Kit
R(C)G-03-*-30	BKRX03660
R(C)G-06-*-30	BKRX06661
R(C)G-10-*-30	BKRX10662
URG*-06-*-10	BKUR06682
URG*-10-*-10	BKUR10683
XGL-03-B-10	BKXL03663
X(C)G-03-*-30	BKRX03660
X(C)G-06-*-30	BKRX06661
X(C)G-10-*-30	BKRX10662

When a subplate is not used, a machined pad (as indicated by shaded area on subplate installation dimensions pages) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be SAE grade 7 or better.

Fluid Cleanliness

Proper fluid condition is essential for long and satisfactory life of hydraulic components and systems. Hydraulic fluid must have the correct balance of cleanliness, materials, and additives for protection against wear of components, elevated viscosity, and inclusion of air.

Essential information on the correct methods for treating hydraulic fluid is included in Vickers publication 561 "Vickers Guide to Systemic Contamination Control" available from your local Vickers distributor or by contacting Vickers, Incorporated. Recommendations on filtration and the selection of products to control fluid condition are included in 561.

Recommended cleanliness levels, using petroleum oil under common conditions, are based on the highest fluid pressure levels in the system and are coded in the chart below. Fluids other than petroleum, severe service cycles, or temperature extremes are cause for adjustment of these cleanliness codes. See Vickers publication 561 for exact details.

Vickers products, as any components, will operate with apparent satisfaction in fluids with higher cleanliness codes than those described. Other manufacturers will often recommend levels above those specified. Experience has shown, however, that life of any hydraulic component is shortened in fluids with higher cleanliness codes than those listed below. These codes have been proven to provide a long, trouble-free service life for the products shown, regardless of the manufacturer.

	System Pressure Level bar (psi)		
Product	**<70 (<1000)**	**70-207 (1000-3000)**	**207+ (3000+)**
Vane Pumps – Fixed	20/18/15	19/17/14	18/16/13
Vane Pumps – Variable	18/16/14	17/15/13	
Piston Pumps – Fixed	19/17/15	18/16/14	17/15/13
Piston Pumps – Variable	18/16/14	17/15/13	16/14/12
Directional Valves	20/18/15	20/18/15	19/17/14
Pressure/Flow Control Valves	**19/17/14**	**19/17/14**	**19/17/14**
CMX Valves	18/16/14	18/16/14	17/15/13
Servo Valves	16/14/11	16/14/11	15/13/10
Proportional Valves	17/15/12	17/15/12	15/13/11
Cylinders	20/18/15	20/18/15	20/18/15
Vane Motors	20/18/15	19/17/14	18/16/13
Axial Piston Motors	19/17/14	18/16/13	17/15/12
Radial Piston Motors	20/18/14	19/17/13	18/16/13

VICKERS®

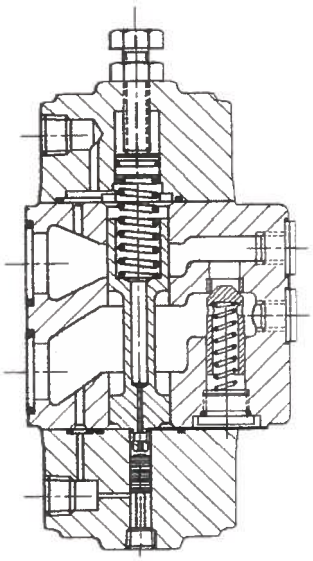
Pressure Relief

Pressure Control Valve

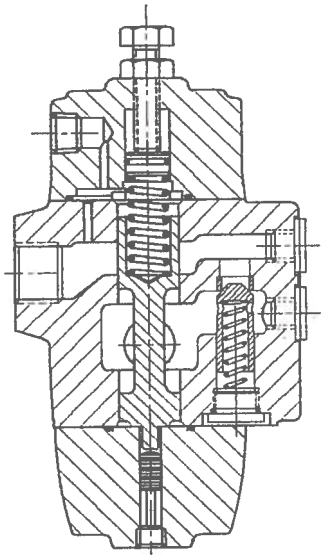
R(C)G(O)-03, 06 and 10; R(C)T(O)-03, 06 and 10

Sectional Illustrations

RCG- Model Shown**



RCT- Model Shown**



Basic Characteristics

Type ..... Sliding spool
Mounting ..... Subplate or manifold
Pipe mounted

Operating
pressure ..... 210 bar (3000 psi) max.
Nominal flow ..... Up to 284 L/min
(75 USgpm)

General Description

The R and RC series valves are of the pressure actuated sliding spool type which can be adapted to perform various circuit functions. These functions, depending on assembly build, include relief valve, sequence valve and counterbalance valve.

Normally Closed Models, R(C)* Series

Back Pressure Valve – Type 1
Internal drain, directly operated. Used for creating back pressure or for overload protection in low pressure circuits up to 35 bar when the secondary port is connected directly to tank.

When provided with an integral check it can be used as a counterbalance or brake valve.

Sequence Valve – Type 2
External drain, directly operated. Used to maintain a minimum pressure at the primary port for a holding operation while permitting pressure build-up downstream of the secondary port outlet.

Sequence Valve – Type 3
External drain, remotely operated. Operation is the same as Type 2 except that it is remotely operated. The valve can be used to sequence independently of the primary pressure.

Unloading Valve – Type 4
Internal drain, remotely operated. Here the secondary port must be connected directly to tank; application of external pressure opens the valve fully, independent of the primary pressure.

When provided with an integral check it can be used as a remotely operated counterbalance or brake valve.

Integral Check – Type RC
Allows free reverse flow.

Auxiliary Remote Control – P feature
Available only on certain R(C)G and R(C)T models with pressure ranges A, B, D and F. Here low pressure remote control is achieved via the auxiliary port.

Normally Open – Type R(C)*O
Here the operation is such that pilot pressure closes the valve. It is used in special counterbalance or decompression circuits.

VICKERS

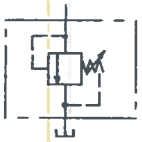
March 1996

GB-2481

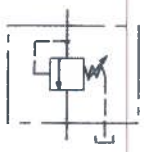
a) Functional Symbols for "Normally Closed" Valves

Surface (Gasket) Mounting RG

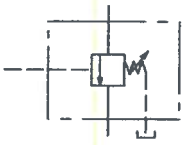
Back pressure valve, directly operated, internal drain, type 1



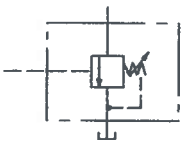
Sequence valve, directly operated, external drain, type 2



Sequence valve, remotely controlled, external drain, type 3



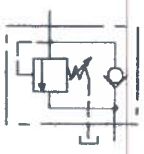
Unloading valve, remotely controlled, internal drain, type 4



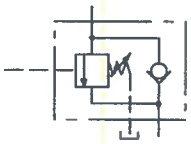
Surface (Gasket) Mounting RCG

Back pressure valve, directly operated, internal drain, type 1

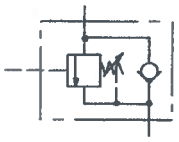
Sequence valve, directly operated, external drain, type 2



Sequence valve, remotely controlled, external drain, type 3

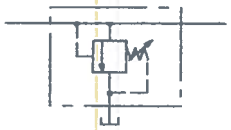


Counterbalance valve, remotely controlled, internal drain, type 4

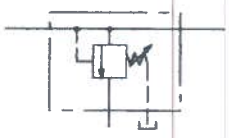


Threaded Port RT

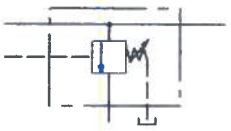
Back pressure valve, directly operated, internal drain, type 1



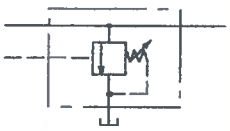
Sequence valve, directly operated, external drain, type 2



Sequence valve, remotely controlled, external drain, type 3

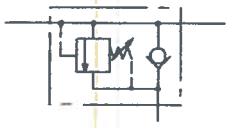


Unloading valve, remotely controlled, internal drain, type 4

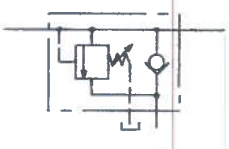


Threaded Port RCT

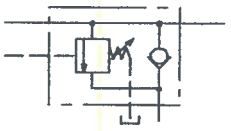
Counterbalance valve, directly operated, internal drain, type 1



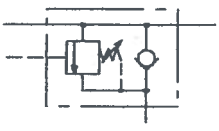
Sequence valve, directly operated, external drain, type 2



Sequence valve, remotely controlled, external drain, type 3



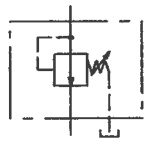
Counterbalance valve, remotely controlled, internal drain, type 4



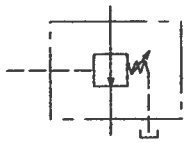
b) Functional Symbols for "Normally Open" Valves

Surface (Gasket) Mounting RGO

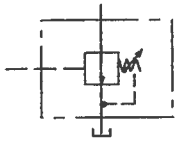
Normally open sequence valve, directly operated, external drain, type 2



Normally open sequence valve, remotely controlled, external drain, type 3

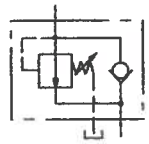


Normally open loading valve, remotely controlled, internal drain, type 4

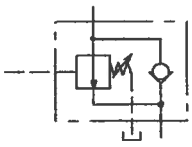


Surface (Gasket) Mounting RCGO

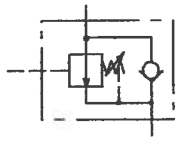
Normally open sequence valve, directly operated, external drain, type 2



Normally open sequence valve, remotely controlled, external drain, type 3

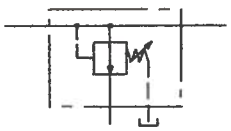


Normally open counterbalance valve, remotely controlled, internal drain, type 4

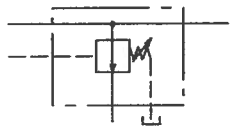


Threaded Port RTO

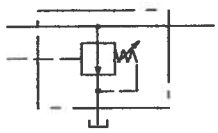
Normally open sequence valve, directly operated, external drain, type 2



Normally open sequence valve, remotely controlled, external drain, type 3

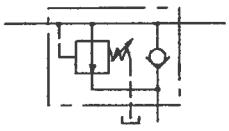


Normally open loading valve, remotely controlled, internal drain, type 4

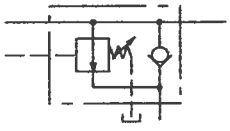


Threaded Port RCTO

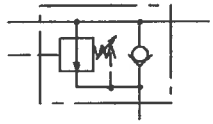
Normally open sequence valve, directly operated, external drain, type 2



Normally open sequence valve, remotely controlled, external drain, type 3



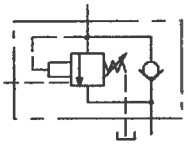
Normally open counterbalance valve, remotely controlled, internal drain, type 4



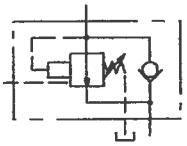
Functional Symbols for Auxiliary Remote Control Connection ("P" Feature)

This option provides a control pressure range of nominally 12.5% of the normally required control pressure range for the A, B and D pressure ranges and at 6.25% for the F pressure range. This feature is only available for certain valves with pressure ranges of A, B, C and F. It is not available for R(C)G(O)-03 models.

"P" Connection



"P" Connection



Model Code

Features in brackets ( ) may be omitted. All other features must be specified.

**F3 - R C * (O) - ** - * (P) * - ** - **

1 2 3 4 5 6 7 8 9 10 11

1 Special seals
See "Hydraulic Fluids" section

2 Pressure control valve

3 Integral check valve
Omit if not required

4 Type of mounting
G = Gasket for subplate or manifold
T = Pipe mounted

5 Normally open valve
Omit if not required
Not available for type 1 valves

6 Nominal valve size
03 = $^3/_8$" nominal bore pipe size
06 = $^3/_4$" nominal bore pipe size
10 = $1^1/_4$" nominal bore pipe size

7 Pressure range
(For availability see table below)
X = 0,7 - 2,1 bar (10 - 30 psi)
Y = 1,4 - 4,1 bar (20 - 60 psi)
Z = 2,4 - 8,6 bar (35 - 125 psi)
A = 5,2 - 17,2 bar (75 - 250 psi)
B = 8,6 - 34,5 bar (125 - 500 psi)
D = 17,3 - 69,0 bar (250 - 1000 psi)
F = 34,5 - 138,0 bar (500 - 2000 psi)

8 Auxiliary low pressure remote control connection
Only available for pressure ranges A, B, D and F.
Not available for R(C)G(O)-03 models.
Omit if not required.

9 Valve type
1 = Internally piloted, internally drained
2 = Internally piloted, externally drained
3 = Externally piloted, externally drained
4 = Externally piloted, internally drained

10 Design number
Currently
22, for R(C)*(O)-10
23, for RT(O)-03, R(C)G(O)-03/06 and R(C)T(O)-06
30, for RCT-03
Subject to change. Installation dimensions remain as shown for design numbers *0 to *9 inclusive.

11 Main port tappings/fixing bolts
UA = NPT pipe threads▲
UB = G pipe threads (BSPF, ISO, 228)
(RT-03 and R(C)T(O)-06/10 models only)
UG = Dual metric/inch fixing bolt facility, R(C)G(O) models only
Omit for RCT-03 (NPT main ports)

▲ *Check with your Vickers representative for availability.*

Performance Data

Maximum Pressures
Main ports▲ ..... 210 bar (3000 psi)
Remote pressure control ports .. As above, for main ports
Auxiliary remote pressure control port "P" feature ..... 140 bar (2000 psi)
Drain port▲ (all models) ..... 140 bar (2000 psi)

▲ *The normal outlet of valve types 1 and 4 must be piped to reservoir at atmospheric pressure. The drain port on types 2 and 3 should similarly be piped directly to reservoir at atmospheric pressure. Any pressure at the drain port is additive to the pressure setting of the valve.*

Basic model designation	"P" feature ■	Principal adjustable pressure range (bar) and model code reference letter							
		0,7 - 2,1 = X	1,4 - 4,1 = Y	1,7 - 8,6 = Z	2,4 - 8,6 = Z	5,2 - 17,2 = A	8,6 - 34,5 = B	17,3 - 69 = D	34,5 - 138 = F
R(C)G or R(C)T	Without feature	●	●		●	●	●	●	●
	With feature					●	●	●	●

■ *Adjustable pressure range at 'P' feature port is nominally 12.5% of the A, B and D ranges and 6.25% of F range.*

Maximum Recommended Flow Rate

Valve model code	Flow rate L/min (USgpm)
R**-03	45 (12)
R**-06	113 (30)
R**-10	284 (75)

Hydraulic Fluids
Materials and seals used in these valves are compatible with:
Anti-wear petroleum oils ..... L-HM
Non-alkyl based
phosphate esters ..... L-HFD
The extreme operating range is 13 to 500 cSt (70 to 2300 SUS) but the recommended running range is 13 to 54 cSt (70 to 250 SUS). For further technical information about fluids see Technical Information leaflet B-920 or I-286-S.

Contamination Control Requirements
Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 9132 or 561, "Vickers Guide to Systemic Contamination Control". The book alos includes information on the Vickers concept of "ProActive Maintenance". The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm. For products in this catalog the recommended levels are:
0 to 210 bar (3000 psi) **18/16/13**

Temperatures
For petroleum oil:
Min. ..... –20°C (–4°F)
Max.* ..... +70°C (158°F)
* *To obtain optimum service life from both fluid and hydraulic system, 65° C (150° F) normally is the maximum temperature.*

For other fluids where limits are outside those of petroleum oil, consult fluid manufacturer or Vickers representative. Whatever the actual temperaure range, ensure that viscosities stay within those specified under "Hydraulic Fluids".

Ambient for:
All valves at full performance specification: 0 to +70°C (32 to +158°F).
Storage:
–25 to +85°C (–13 to +185°F)

Pressure Adjustment

Adjust pressure by loosening locknut and turning adjusting screw in appropriate direction, clockwise to increase pressure counter-clockwise to decrease pressure.

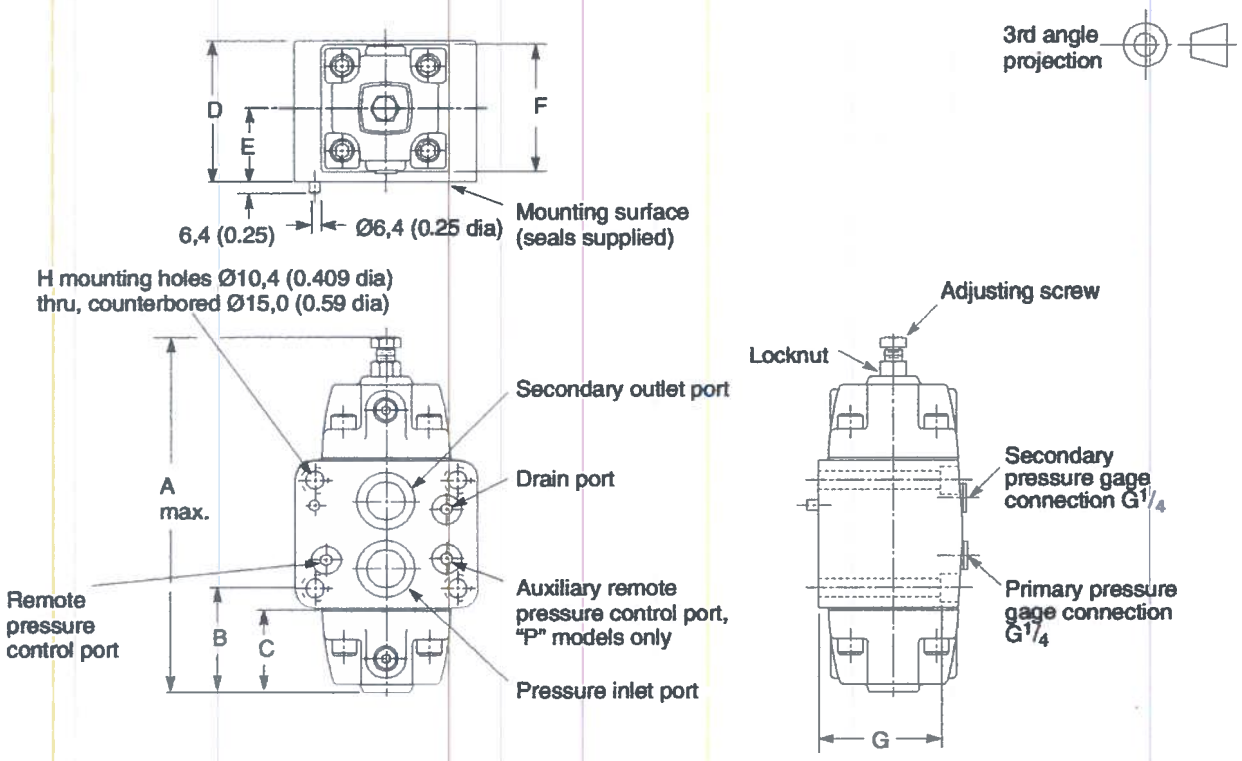
Pressure settings must be at least 17 bar (250 psi) lower than the system relief setting.

The remote pressure control connection on valve types 3 and 4 must be connected to an external pilot pressure source sufficient to operate the valve at the desired pressure and flow conditions.

All models, except those with X, Y or Z pressure range and all R(C)G(O)-03, are available with an auxiliary remote control connection. Required pressure at the auxiliary connection is 6.25% of the normally required control pressure for the F pressure range and 12.5% of the normally required control for the A, B and D pressure range.

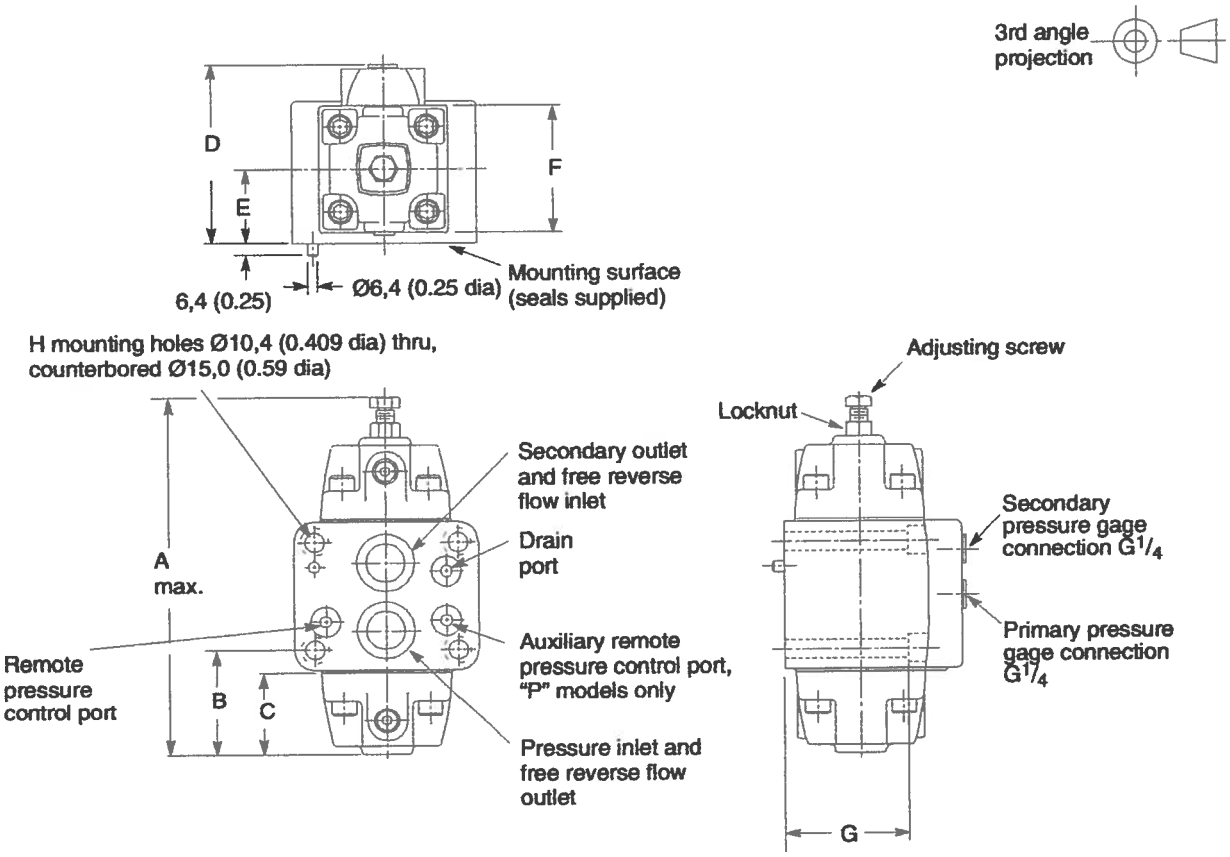
Installation Dimensions **in mm (inches)**

RG(O)-03/06/10



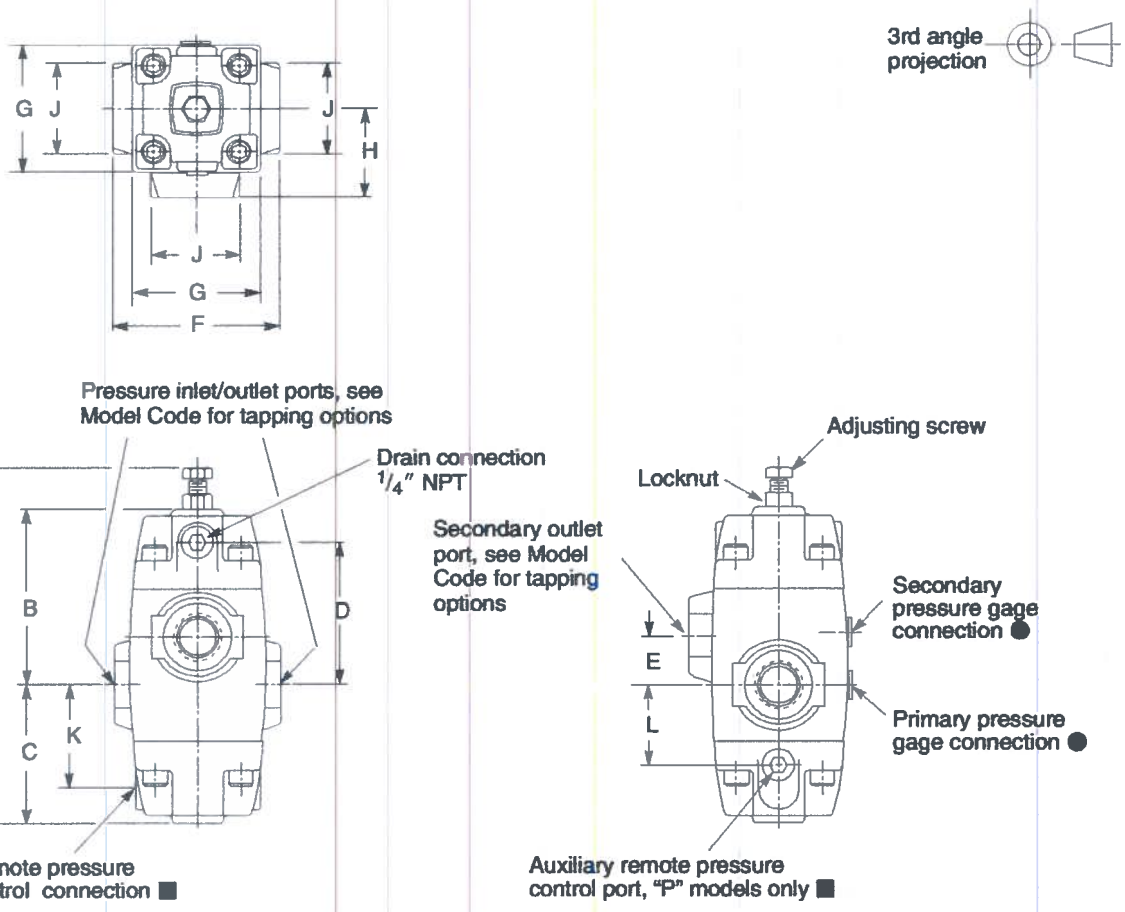
Model	A	B	C	D	E	F	G	H
RG-03	177,8 (7.0)	39,9 (1.57)	29,7 (1.17)	66,5 (2.62)	36,6 (1.44)	57,1 (2.25)	57,0 (2.24)	4
RG-06	200,2 (7.88)	55,7 (2.19)	44,7 (1.76)	79,2 (3.12)	41,1 (1.62)	71,4 (2.81)	69,6 (2.74)	4
RG-10	277,9 (10.94)	54,7 (2.15)	44,7 (1.76)	100,0 (3.94)	50,8 (2.0)	95,3 (3.75)	90,4 (3.56)	6

RCG(O)-03/06/10



Model	A	B	C	D	E	F	G	H
RCG-03	177,8 (7.0)	39,9 (1.57)	29,7 (1.17)	90,4 (3.56)	36,6 (1.44)	57,1 (2.25)	57,0 (2.24)	4
RCG-06	200,2 (7.88)	55,7 (2.19)	44,7 (1.76)	98,6 (3.88)	41,1 (1.62)	71,4 (2.81)	69,6 (2.74)	4
RCG-10	277,9 (10.94)	54,7 (2.15)	44,7 (1.76)	130,8 (5.15)	50,8 (2.0)	95,3 (3.75)	90,4 (3.56)	6

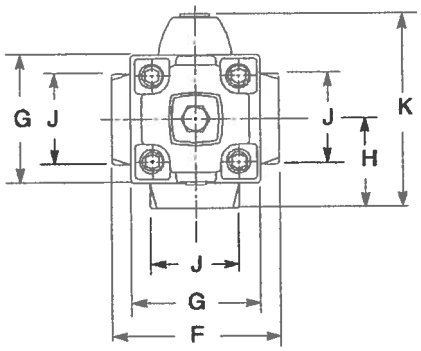
RT(O)-03/06/10



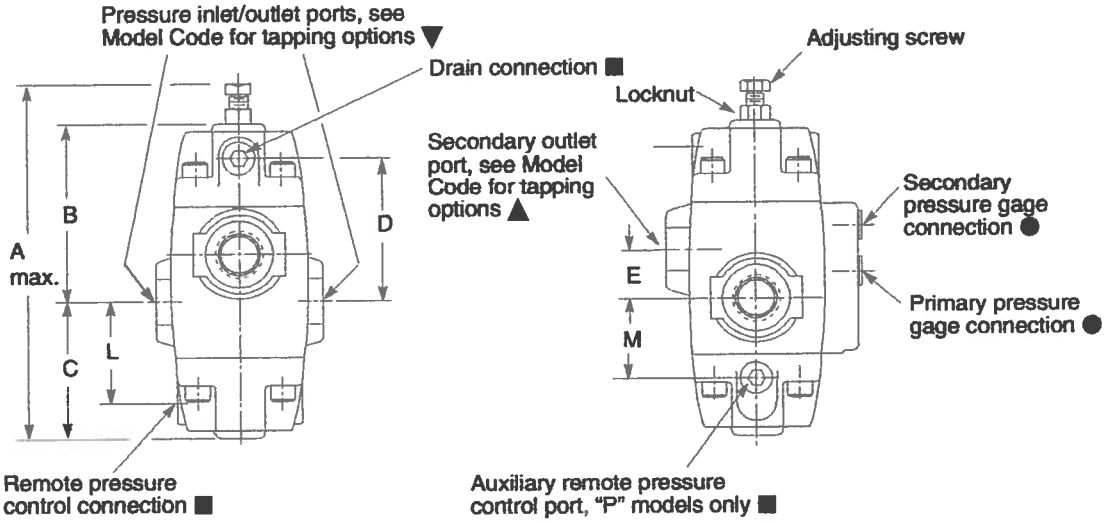
■ *RT-03 ..... 9/16"-18 UNF-2B SAE O-ring port*
All others ..... 1/4" NPT
● *RT-03 ..... 7/16"-20 UNF-2B SAE O-ring port*
UA- suffix models ..... 1/4" NPT
UB- suffix models G1/4

Model	A	B	C	D	E	F	G	H	J	K	L
RT-03	177,8 (7.0)	97,0 (3.82)	54,0 (2.13)	58,7 (2.31)	23,1 (0.91)	70,0 (2.76)	59,4 (2.34)	39,6 (1.56)	35,1 (1.38)	42,9 (1.69)	37,3 (1.47)
RT-06	200,2 (7.88)	97,0 (3.82)	74,9 (2.95)	79,5 (3.13)	26,9 (1.06)	93,0 (3.66)	76,0 (2.99)	49,3 (1.94)	50,8 (2.0)	57,2 (2.25)	45,2 (1.78)
RT-10	277,9 (10.94)	154,2 (6.07)	84,3 (3.32)	80,5 (3.17)	28,7 (1.13)	118,0 (4.65)	98,6 (3.88)	68,3 (2.69)	86,4 (3.40)	70,9 (2.79)	57,2 (2.25)

RCT(O)-03/06/10



3rd angle projection



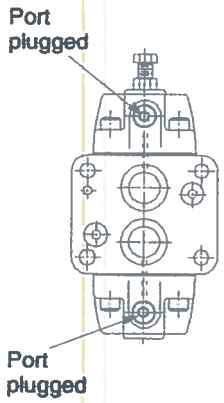
■ *RCT-03 ..... 9/16" -18 UNF-2B SAE O-ring port*
All others ..... 1/4" NPT
● *RCT-03 ..... 7/16" -20 UNF-2B SAE O-ring port*
UA- suffix models ..... 1/4" NPT
UB- suffix models G1/4
▲ *Also free reverse flow inlet.*
▼ *Also free reverse flow outlets.*

Model	A	B	C	D	E	F	G	H	J	K	L	M
RCT-03	177,8 (7.0)	97,0 (3.82)	54,0 (2.13)	58,7 (2.31)	23,1 (0.91)	70 (2.76)	59,4 (2.34)	39,6 (1.56)	35,1 (1.38)	93,7 (3.69)	42,9 (1.69)	37,3 (1.47)
RCT-06	200,2 (7.88)	97,0 (3.82)	74,9 (2.95)	79,5 (3.13)	26,9 (1.06)	93 (3.66)	76,0 (2.99)	49,3 (1.94)	50,8 (2.0)	107,0 (4.21)	57,2 (2.25)	45,2 (1.78)
RCT-10	277,9 (10.94)	154,2 (6.07)	84,3 (3.32)	80,5 (3.17)	28,7 (1.13)	118 (4.65)	98,6 (3.88)	68,3 (2.69)	86,4 (3.40)	147,6 (5.81)	70,9 (2.79)	57,2 (2.25)

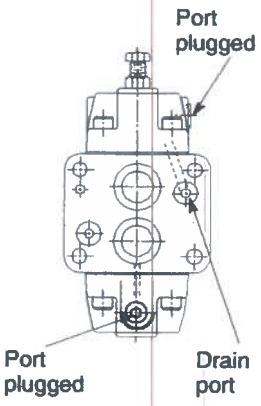
Basic Models
Basic models are distinguished by the relative orientation of top and bottom caps and by the presence or absence of port plugs in the caps.

R(C)G Models

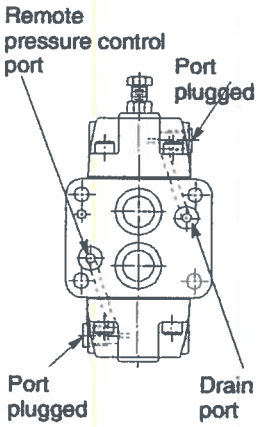
Directly operated, internal drain, type 1



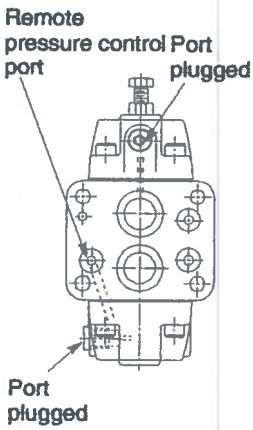
Directly operated, external drain, type 2



Remotely controlled, external drain, type 3

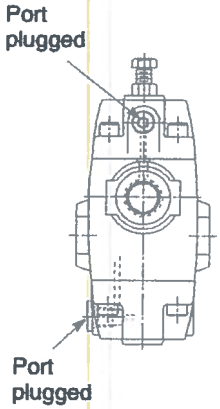


Remotely controlled, internal drain, type 4

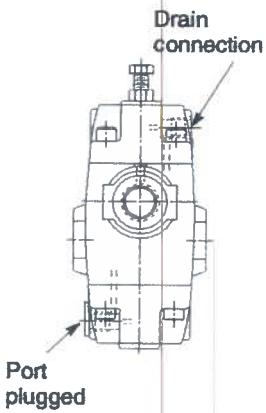


R(C)T models

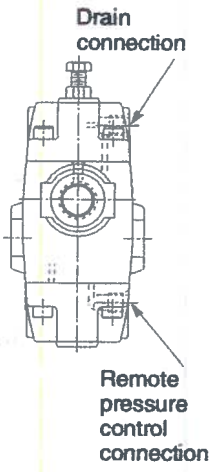
Directly operated, internal drain, type 1



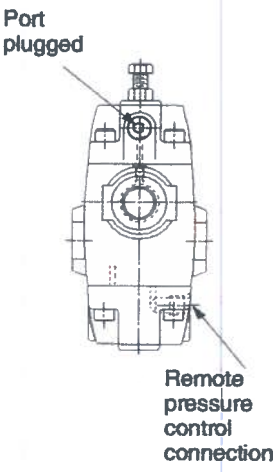
Directly operated, external drain, type 2



Remotely controlled, external drain, type 3



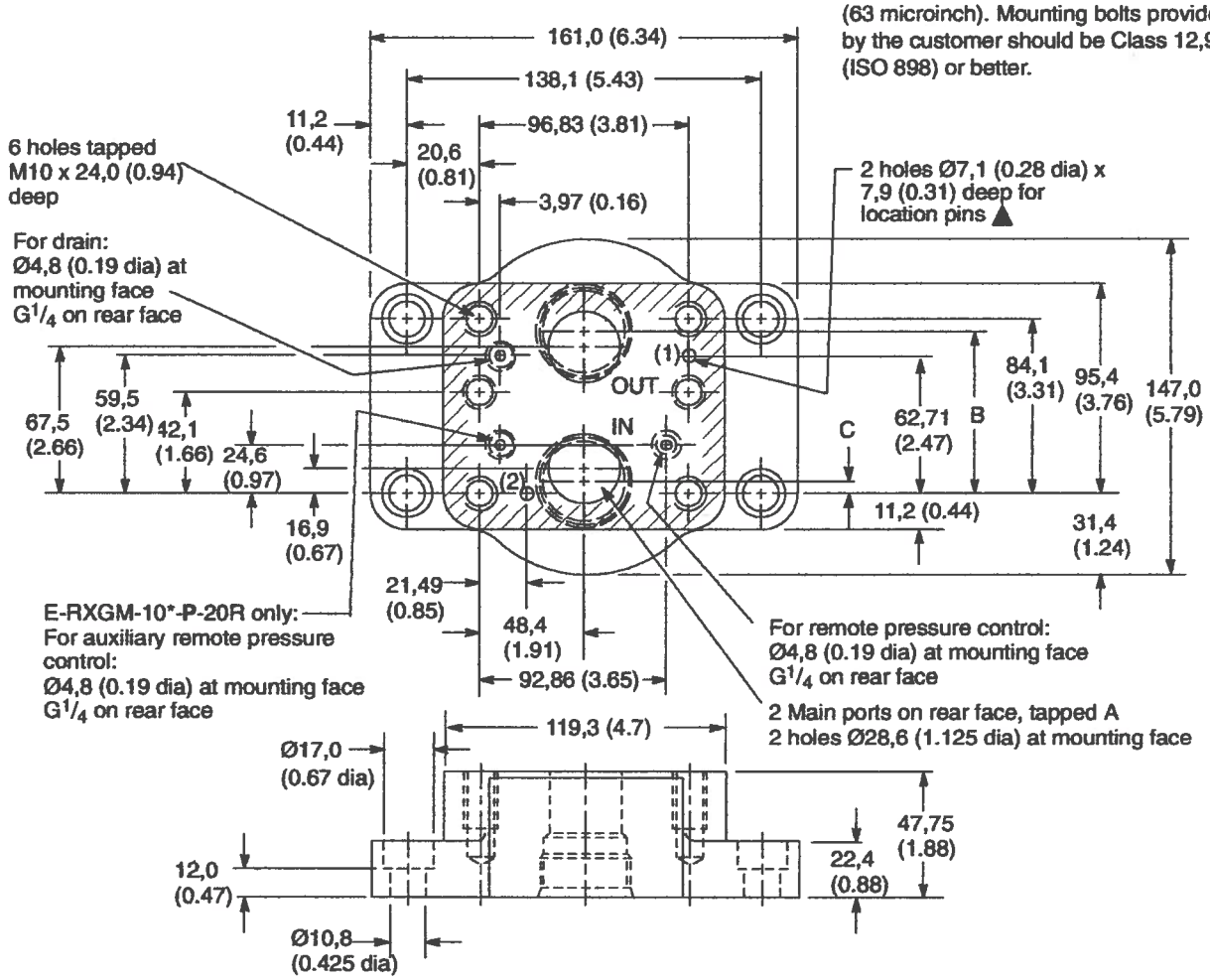
Remotely controlled, internal drain, type 4



Note: Type 2, 3 and 4 illustrations also apply to "normally open" models, available only in the R(C)GO and R(C)TO ranges. Functional symbols.

E-RXGM-10(X) Subplate

When a subplate is not used, a machined pad (as indicated by shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 µm (63 microinch). Mounting bolts provided by the customer should be Class 12,9 (ISO 898) or better.

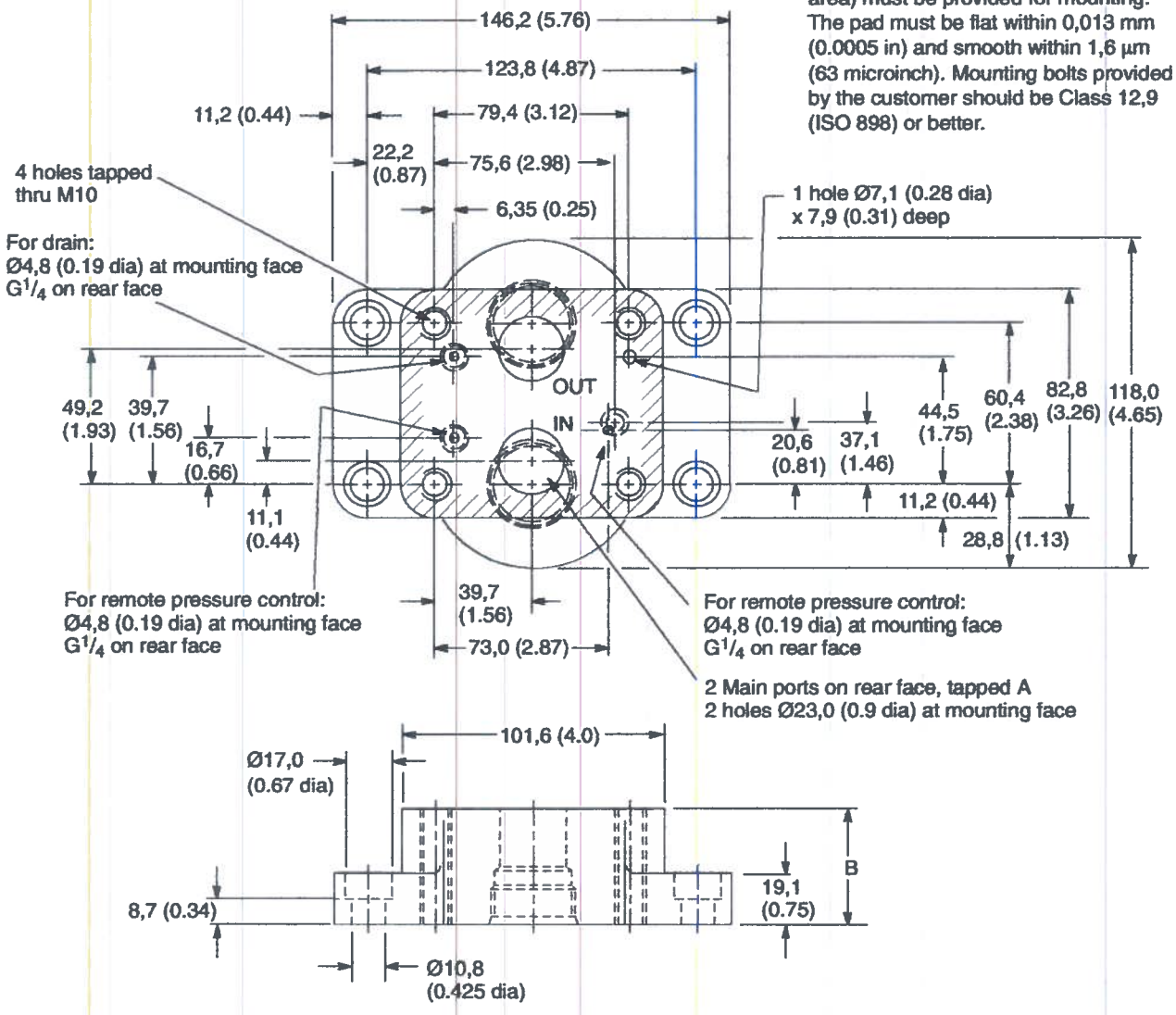


▲ *Pin at location (1) for pilot operated check valves; at location (2) for pressure reducing valves.*

Model	A	B	C
E-RXGM-10-20R	G1 1/4	76,2 (3.0)	7,9 (0.31)
E-RXGM-10X-20R	G1 1/2	78,1 (3.1)	6,0 (0.24)

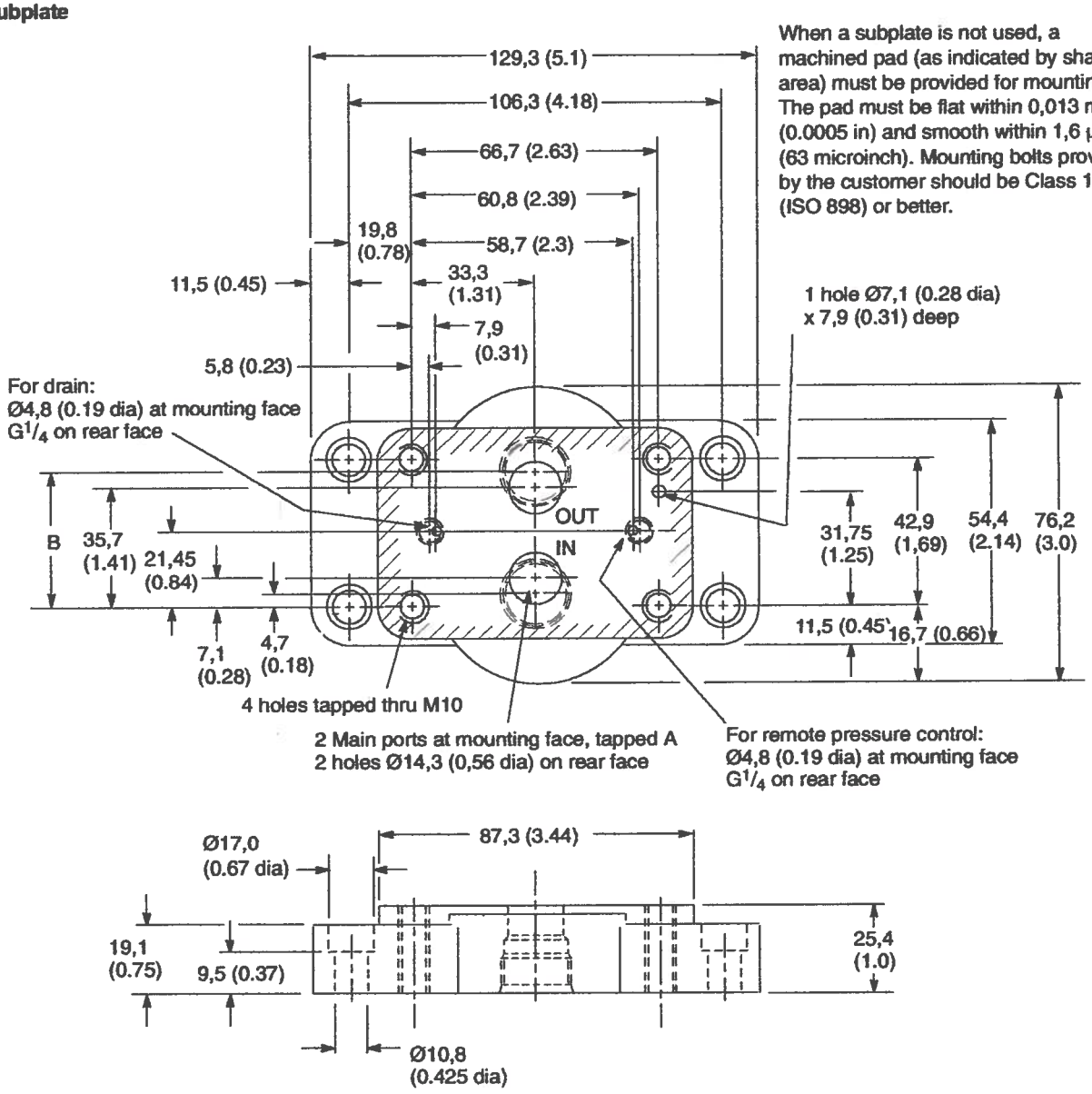
E-RXGM-06
Subplate

When a subplate is not used, a machined pad (as indicated by shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 µm (63 microinch). Mounting bolts provided by the customer should be Class 12,9 (ISO 898) or better.



Model	A	B
E-RXGM-06-20R	G3/4	34,9 (1.37)
E-RXGM-06X-20R	G1	41,2 (1.62)

E-RXGM-03
Subplate


When a subplate is not used, a machined pad (as indicated by shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 µm (63 microinch). Mounting bolts provided by the customer should be Class 12,9 (ISO 898) or better.
129,3 (5.1)
106,3 (4.18)
66,7 (2.63)
60,8 (2.39)
19,8 (0.78)
58,7 (2.3)
33,3 (1.31)
11,5 (0.45)
7,9 (0.31)
5,8 (0.23)
1 hole Ø7,1 (0.28 dia) x 7,9 (0.31) deep
For drain: Ø4,8 (0.19 dia) at mounting face G1/4 on rear face
B
35,7 (1.41)
21,45 (0.84)
OUT
IN
31,75 (1.25)
42,9 (1,69)
54,4 (2.14)
76,2 (3.0)
11,5 (0.45)
16,7 (0.66)
7,1 (0.28)
4,7 (0.18)
4 holes tapped thru M10
2 Main ports at mounting face, tapped A
2 holes Ø14,3 (0,56 dia) on rear face
For remote pressure control: Ø4,8 (0.19 dia) at mounting face G1/4 on rear face

Model	A	B
E-RXGM-03-20R	G3/8	38,1 (1.5)
E-RXGM-03X-20R	G1/2	40,4 (1.59)

Mass

Valve model code	Mass kg (lb)
RG(O)-03	3,7 (1.7)
RG(O)-06	6,4 (2.9)
RG(O)-10	12,0 (5.5)
RCG(O)-03	4,2 (2.0)
RCG(O)-06	7,0 (3.2)
RCG(O)-10	13,0 (5.9)
RT(O)-03	2,8 (1.3)
RT(O)-06	5,7 (2.6)
RT(O)-10	12,1 (5.5)
RCT(O)-03	3,0 (1.4)
RCT(O)-06	5,9 (2.7)
RCT(O)-10	13,0 (5.9)

Mounting Attitude

Optional, horizontal preferred.

Ordering Procedure

When ordering a unit please specify the complete model code which is applicable to your requirements.

Subplates and bolt kits are supplied as separate units and therefore must be ordered as such.

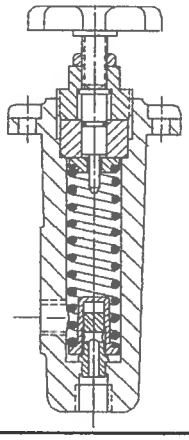
Example
Valve RG-06-A-2-23-UG
Subplate E-RXGM-06X-20R
Bolt kit BKRX-06-661M

Bolt kits available
Model code
BKRX-03-660M ..... M10 x 70
BKRX-06-661M ..... M10 x 80
BKRX-10-662M ..... M10 x 110

Pressure Relief Valves

C175, 11 Design

Typical Section



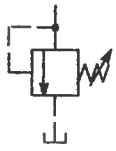
Basic Characteristics

Operating pressures ... Up to 210 bar (3000 psi)
Flow rating ..... 12 L/min (3.2 USgpm)
Mounting ..... Panel

General Description

This single-stage valve is designed for applications requiring an adjustable pressure relief valve or pressure regulating valve of small capacity. It may also be used as a remote control valve for pilot operated pressure control valves (e.g. models ECG-06/10).

Functional Symbol



Model Code

F3- C-175 - * -11UB

1 2 3 4 5

1 Special seals
See "Hydraulic Fluids" section.

2 Basic model

3 Pressure adjustment range
B = 5,2-69 bar (75-1000 psi)
C = 35-138 bar (500-2000 psi)
F = 104-210 bar (1500-3000 psi)

4 Design number
Subject to change.
Installation dimensions remain as shown for designs 10-19 inclusive.

5 Port tappings
UB= G (BSPF) pipe threads

Operating Data

Maximum Pressure
According to adjustment range. See "Model Code" above.

Maximum Flow Rate
All models ..... 12 L/min (3.2 USgpm)

Hydraulic Fluids and Seals
All valves can be used with antiwear hydraulic oils, water-in-oil emulsions and water glycols.

Add prefix "F3" to model designation when phosphate ester (except alkyl-based) or chlorinated hydrocarbons are to be used.

Viscosities can range between 860 and 13 cSt (4000 and 70 SUS) but the recommended running range is from 54 to 13 cSt (245 to 70 SUS).

For further information about fluids see leaflet 694.

Temperature Limits
Ambient
Min. ..... –20°C (–4°F)
Max. ..... +70°C (158°F)

Fluid temperature

	Petroleum oil	Water-containing
Min.	–20°C (–4°F)	+10°C (50°F)
Max.*	+80°C (+176°F)	+54°C (129°F)

* *To obtain optimum service life from both fluid and hydraulic system 65° C (150° F) normally is the maximum temperature except for water-containing fluids.*

For synthetic fluids consult manufacturer or Vickers representative where limits are outside those for petroleum use. Whatever the actual temperature range, ensure that viscosities stay within the limits specified in the "Hydraulic Fluids" section.

Contamination Control Requirements
Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 561, "Vickers Guide to Systemic Contamination Control". The book also includes information on the Vickers concept of "ProActive Maintenance".The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm. For products in this catalog the recommended levels are:

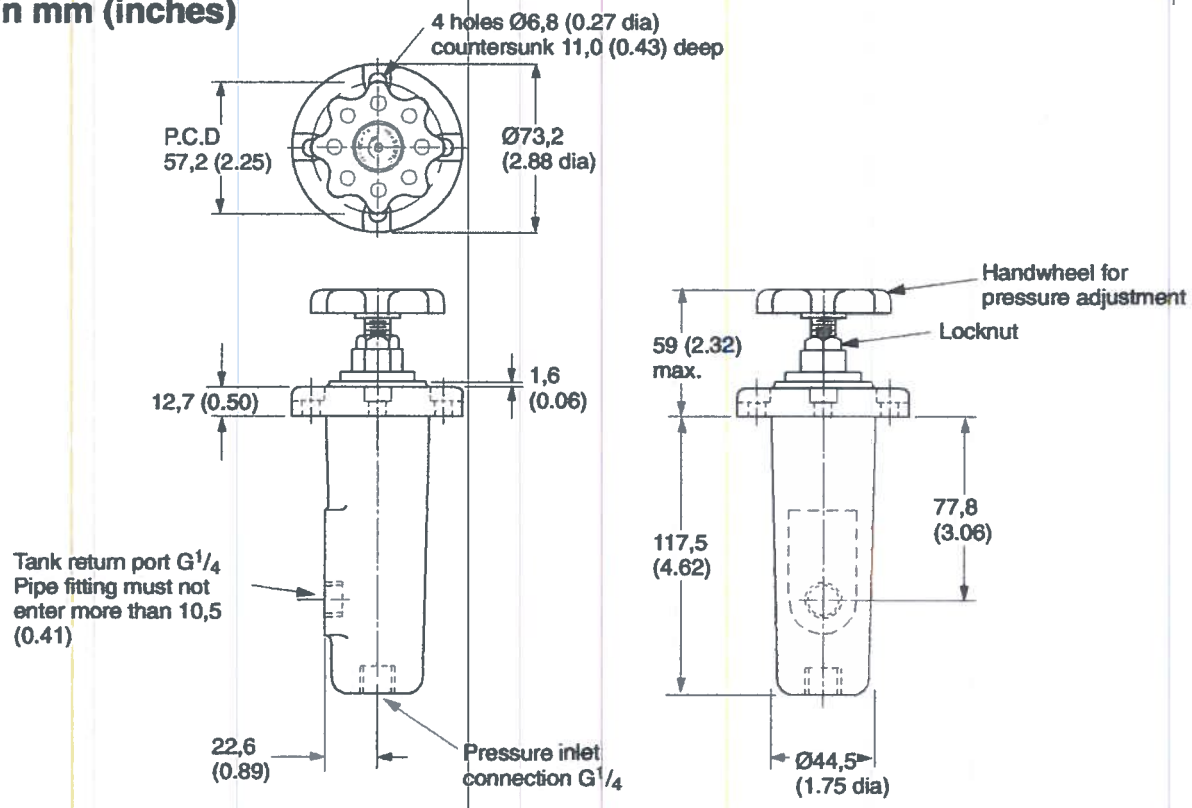
Up to 210 bar (3000 psi) **19/17/14**

Control Data
The adjust the pressure slacken the locknut and turn the hand-wheel clockwise to increase pressure and counter-clockwise to decrease pressure, retighten locknut after setting the pressure.

The outlet port should be piped direct to tank at atmospheric pressure. Any pressure at the drain port is additive to the pressure setting of the valve.

Installation Dimensions
in mm (inches)

3rd angle projection



Mass

All models ..... 1,6 kg (3.52 lb)

Mounting Attitude

Optional.

Ordering Procedure

Before ordering check availability with your Vickers representative.

When ordering, please specify the complete model designation(s) of the valve(s) required. See "Model Code".

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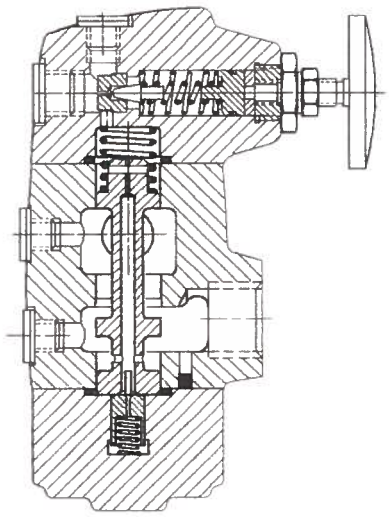
Pressure Relief

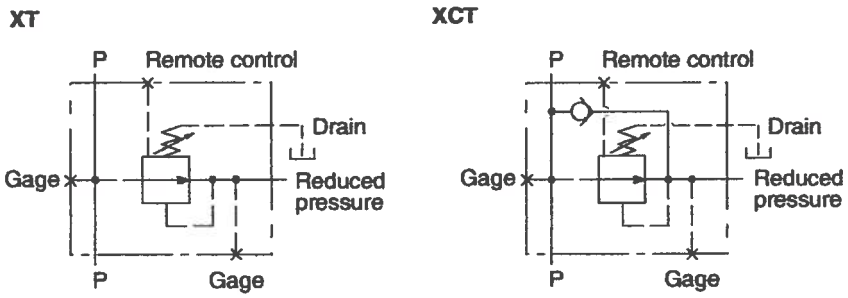
Pressure Reducing Valves for Line Mounting

XT-03, 20 Series
X(C)T-06/10, 20 Series

Typical Section



Functional Symbols



Model Code

(F3-) X (C) T- ** - * * - 2* - UB

1 2 3 4 5 6 7

Basic Characteristics

Maximum supply pressure .... 210 bar (3000 psi)
Maximum flow ..... 284 l/min (75 USgpm)

General Description

Pressure reducing valves are used to reduce system pressure to a constant reduced outlet pressure regardless of fluctuations in the main system above the selected pressure.

The XCT models have an integral check valve that allows free flow from the outlet connection to inlet connection.

1 Special seals for phosphate ester fluids
Omit if not required

2 Reverse free flow check valve, 06 and 10 sizes only
Omit if not required

3 Nominal size
03 = 3/8"
06 = 3/4"
10 = 1 1/4"

4 Maximum adjustable reduced pressure
1 = 70 bar (1000 psi)
2 = 140 bar (2000 psi)
3 = 200 bar (2850 psi)

5 Flow rate/min. reduced pressure combinations
For use of, and performance data for symbols B or F at this location, see table "Max. Flow Rate and Min. Reduced Pressures" on next page.

6 Design number, 20 series
Subject to change. Installation dimensions unaltered for design numbers 20 to 29 inclusive.

7 Port threads
UB = G (BSPF) thread to ISO 228/1

VICKERS

Maximum Pressure
Inlet ports ..... 210 bar (3000 psi)
Drain ports ..... 1,7 bar (25 psi)
Note: Drain ports must be piped direct to reservoir. Any back pressure at this port will increase the effective pressure setting of the valve by the same amount.

Max. Flow Rate and Min. Reduced Pressures
Typical with petroleum oil at 21 cSt (102 SUS) and at 50°C (122°F).

Model type	Reduced pressure range Maximum bar	(psi)	Minimum bar	(psi)	Max. flow rate L/min	(USgpm)
XT-03-1B	70	(1000)	5,25	(76)	26	(6.7)
-1F			10,4	(150)	53	(14)
-2B	140	(2000)	5,25	(76)	26	(6.7)
-2F			10,4	(150)	53	(14)
-3B▲						
-3F	200	(2850)	10,4	(150)	53	(14)
X(C)T-06-1B	70	(1000)	5,6	(81)	57	(15)
-1F			13,8	(200)	114	(30)
-2B	140	(2000)	5,6	(81)	57	(15)
-2F			13,8	(200)	114	(30)
-3B	200	(2850)	5,6	(81)	57	(15)
-3F			13,8	(200)	114	(30)
X(C)T-10-1B			6,9	(100)	95	(25)
-1B■	70	(1000)	11,4	(165)	190	(50)
-1F			15,5	(225)	284	(75)
-2B			6,9	(100)	95	(25)
-2B■	140	(2000)	11,4	(165)	190	(50)
-2F			15,5	(225)	284	(75)
-3B			6,9	(100)	95	(25)
-3B■	200	(2850)	11,4	(165)	190	(50)
-3F			15,5	(225)	284	(75)

▲ *XT-03-3B combination not recommended. If max. inlet pressure is required with min. rated reduced pressure, consult your Vickers representative.*
■ *Alternative data giving max. flow for -*B- combinations.*

Inlet Pressure Setting
For proper functioning the inlet pressure must be maintained at least 10 bar (150 psi) above the setting of the reduced outlet pressure.

Remote Pressure Control
Reduced pressure may be adjusted remotely by connecting the remote control connection to the inlet port of a C-175 relief valve (catalog 411) or a CGR-02 relief valve (catalog 409).

Pressure setting of the X(C)T valve must be higher than that of the remote control valve.

Hydraulic Fluids
X(C)T valves are suitable for use with hydraulic oils, oil-in-water emulsions and water glycols.

When fitted with special seals (specify "F3" in model code [1]) these valves are suitable for use with phosphate esters (not alkyl-based).

The extreme operating range is from 500 to 13 cSt (2270 to 70 SUS) but the recommended running range is 54 to 13 cSt (245 to 70 SUS).

Temperature Limits
Ambient:
Minimum ..... –20°C (–4°F)
Maximum ..... +70°C (+158°F)

Fluid Temperature

	Petroleum oil	Water-containing
Min.	–20°C (–4°F)	+10°C (+50°F)
Max.*	+80°C (+176°F)	+54°C (+130°F)

* *To obtain optimum service life from both fluid and hydraulic system, 65° C (150° F) is the recommended maximum fluid temperature, except for water-containing fluids.*

For synthetic fluids consult the fluid manufacturer or Vickers where limits are outside those for petroleum oil.

Contamination Control Requirements
Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 9132 or 561, "Vickers Guide to Systemic Contamination Control". The book also includes information on the Vickers concept of "ProActive Maintenance". The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm. For products in this catalog the recommended levels are:

Up to 210 bar (3000 psi) 19/17/14

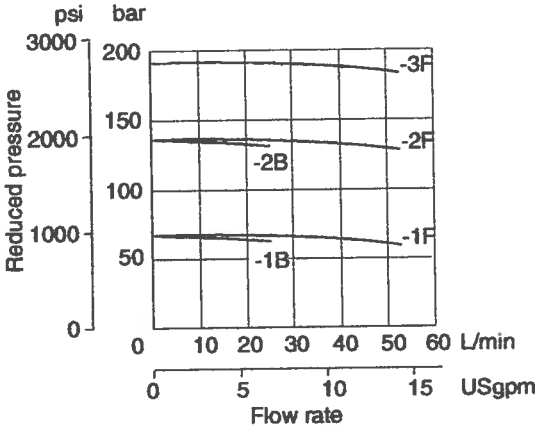
Mounting Attitude
Unrestricted.

Performance Data

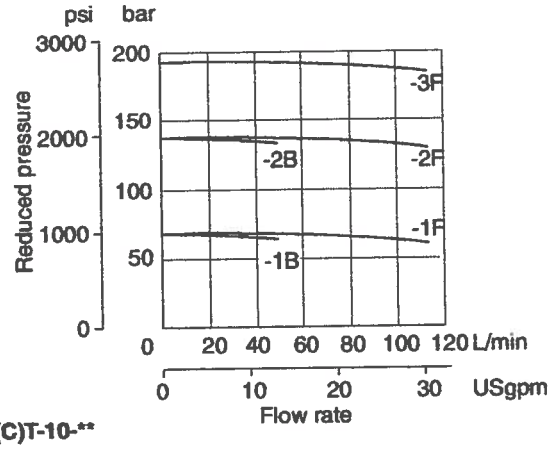
Typical with petroleum oil at 21 cSt (102 SUS) and at 50°C (122°F).

Reduced Pressure Override

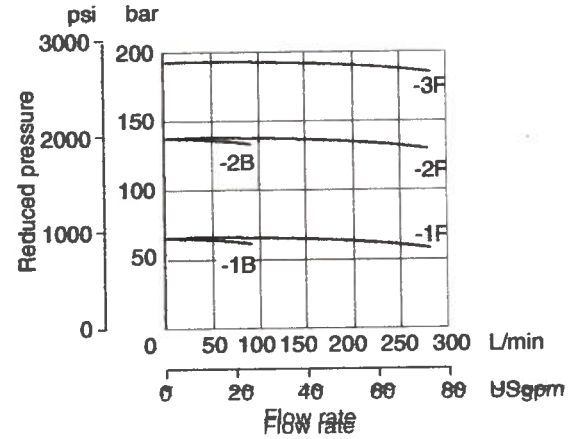
XT-03-**



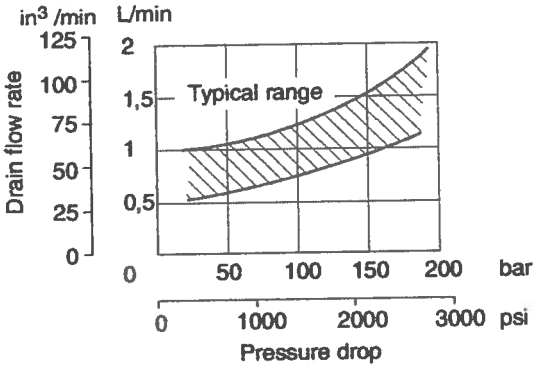
X(C)T-06-**



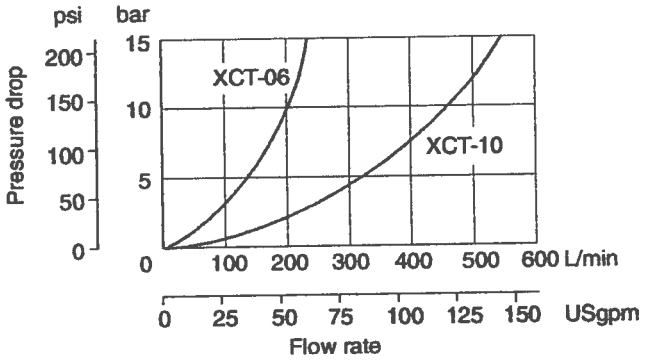
X(C)T-10-**



Pilot Control (Drain) Flow



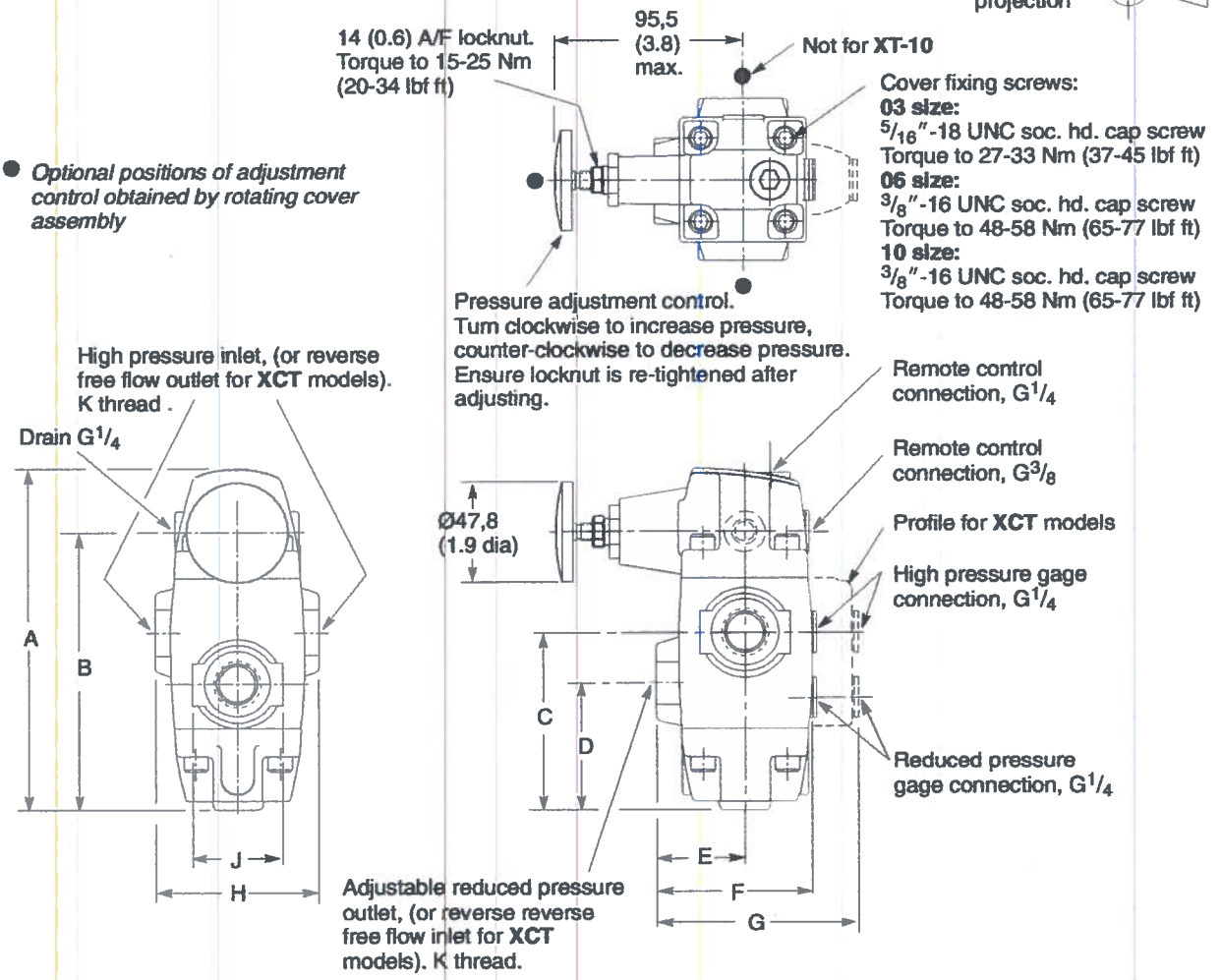
Pressure Drop



Installation Dimensions **in mm (inches)**

4CS-03 and 4CT(1)-06/10, Pipe-Mounted Models

3rd angle projection


14 (0.6) A/F locknut. Torque to 15-25 Nm (20-34 lbf ft)
95,5 (3.8) max.
Not for XT-10
Cover fixing screws:
03 size:
5/16"-18 UNC soc. hd. cap screw
Torque to 27-33 Nm (37-45 lbf ft)
06 size:
3/8"-16 UNC soc. hd. cap screw
Torque to 48-58 Nm (65-77 lbf ft)
10 size:
3/8"-16 UNC soc. hd. cap screw
Torque to 48-58 Nm (65-77 lbf ft)
● Optional positions of adjustment control obtained by rotating cover assembly
Pressure adjustment control. Turn clockwise to increase pressure, counter-clockwise to decrease pressure. Ensure locknut is re-tightened after adjusting.
High pressure inlet, (or reverse free flow outlet for XCT models). K thread .
Drain G1/4
Remote control connection, G1/4
Remote control connection, G3/8
Ø47,8 (1.9 dia)
Profile for XCT models
High pressure gage connection, G1/4
Reduced pressure gage connection, G1/4
A
B
C
D
E
F
G
H
J
Adjustable reduced pressure outlet, (or reverse reverse free flow inlet for XCT models). K thread.

Model	A	B	C	D	E	F	G	H	J	K
XT-03	142,2 (5.6)	116,8 (4.6)	69,1 (2.7)	46 (1.8)	39,6 (1.6)	69,4 (2.7)	– –	69,9 (0.27)	35,1 (1.4)	G3/8"
X(C)T-06	176,5 (7)	151,1 (5.9)	96,8 (3.8)	69,9 (2.75)	39,6 (1.6)	87,2 (3.4)	106,4 (4.2)	92,2 (3.6)	50,8 (2)	G3/4"
X(C)T-10	211,2 (8.3)	182,6 (7.2)	109,7 (4.3)	81 (3.2)	68,3 (2.7)	117,3 (4.6)	147,6 (5.8)	117,3 (4.6)	86,4 (3.4)	G1 1/4"

Mass

XT-03 ..... 3,2 kg (7 lb)
XT-06 ..... 5,6 kg (12.3 lb)
XT-10 ..... 12,1 kg (26.6 lb)
XCT-06 ..... 5,9 kg (13 lb)
XCT-10 ..... 13,0 kg (28.6 lb)

Ordering Procedure

Specify full Model Code.

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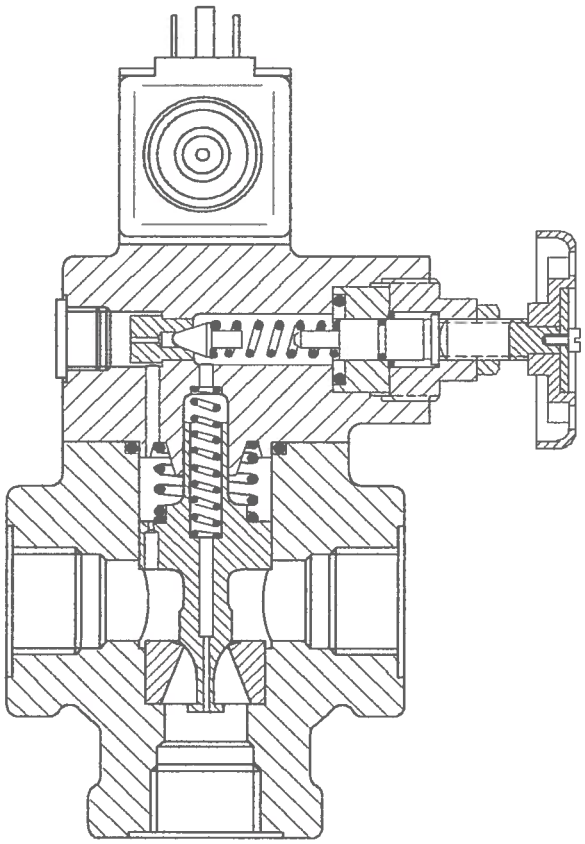
Pressure Relief

Pressure Relief Valves for Pipe Mounting

ECT-06/10, 10 Series; ECT5-06/10, 30 Series

Typical Section

ECT5-10 example



Basic Characteristics

Max. pressure . . . . . 250 bar (3625 psi)
Max. flow rates:
ECT(5)-06 . . . . 200 L/min (757 US gpm)
ECT(5)-10 . . 380 L/min (1440 US gpm)

General Description

These adjustable pressure relief valves limit system pressure by directing pump flow to reservoir when the system pressure reaches the setting of the valve, thus preventing overloading the system. Their two-stage design ensures fast response and minimal pressure override. In addition to the conventional relief valve operation, a pilot venting feature allows the system pressure to be dropped to near-zero, or to a low-level pressure.

The valve is available in two versions: type ECT5, with integral solenoid operated pilot valve, and in basic form, type ECT.

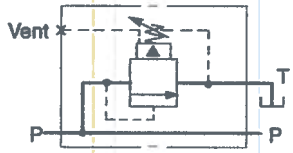
In the "ECT5" version, the pilot valve provides for selection of up to three pressures or one/two pressures plus off-loading according to the model type. The circuitry options can be further extended by the use of remote control valves.

In both the "ECT" and "ECT5" versions the "Vent" port can be connected to an on/off valve for load/unload, or to a pressure pilot valve for remote control of the pressure setting.

For both models the integral manual pressure adjustment is available as screw/locknut, or micrometer with keylock.

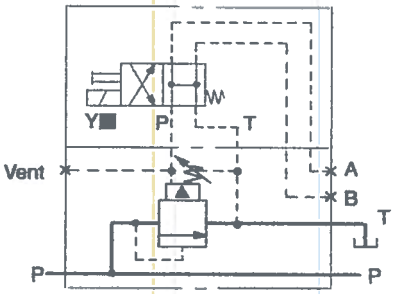
Functional Symbols

ECT valves

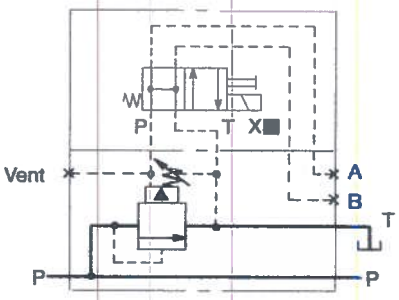


Notes:
1. All valves: Vent port fitted with removable plug.
2. ECT5 models: A and B ports fitted with removable plugs.
3. ECT5 models: Each valve carries two nameplates:
   The mainstage valve carries the lower half of the functional symbol and shows the full valve model code.
   The solenoid pilot valve carries the upper part of the functional symbol and shows the model code of the individual pilot valve.

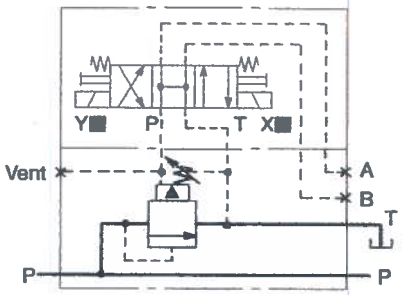
ECT5-*(V)-0B**
Solenoid de-energized = Vented
Solenoid energized = On-load, by integral control



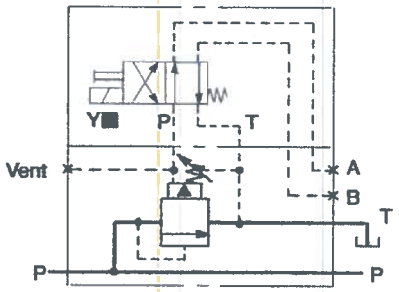
ECT5-*(V)-0BL**
Solenoid de-energized = Vented
Solenoid energized = On-load, by integral control



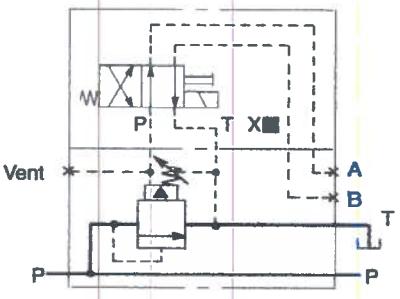
ECT5-*(V)-0C**
Both solenoids de-energized = Vented
Right-hand solenoid■ energized = On-load, externally controlled at A
Left-hand solenoid■ energized = On-load, externally controlled at B



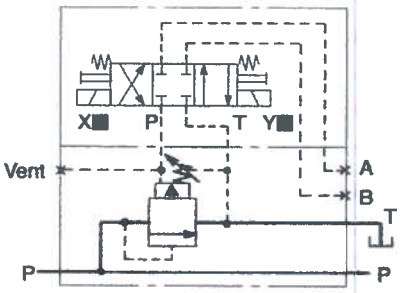
ECT5-*(V)-2A**
Solenoid de-energized = On-load, externally controlled at A (or integral control if A plugged)
Solenoid energized = On-load, externally controlled at B (or integral control if B plugged)



ECT5-*(V)-2AL**
Solenoid de-energized = On-load, externally controlled at B (or integral control if B plugged)
Solenoid energized = On-load, externally controlled at A (or integral control if A plugged)



ECT5-*(V)-2C**
Both solenoids de-energized = On-load, by integral control
Right-hand solenoid■ energized = On-load, externally controlled at A
Left-hand solenoid■ energized = On-load, externally controlled at B



■ *For solenoid identities, "Sol. A"/"Sol. B", see nine pages on.*

Model Codes

Features in brackets ( ) may be omitted if not required. All other features must be specified.

Basic Models (Without Integral Solenoid Pilot Valve)

(F3-)ECT- * (V)(-K)-1*TB**

1 2 3 4 5 12

Models With Integral Solenoid Pilot Valve

(F3-)ECT5- * (V)(-K)-*** (-*)-(V)M-*** (L)- * 5-3* TB**

1 2 3 4 5 6 7 8 9 10 11 12

1 Fluid compatibility

Blank = Anti-wear hydraulic oil (class L-HM), invert emulsion (class L-HFB) or water glycol (class L-HFC)
F3 = As above or phosphate ester (class L-HFD)

2 Nominal bore size

06 = $^3/_4$"
10 = $1^1/_4$"

3 Pressure adjustment range

B = 5 to 70 bar (75 to 1000 psi)
C = 35 to 140 bar (500 to 2000 psi)
F = 100 to 250 bar (1450 to 3625 psi)

4 High vent spring

Omit for low vent spring

5 Pressure adjustment method

K = Micrometer with keylock
Omit for screw/locknut method

6 Integral pilot valve spool/ spring arrangement

0B, 0BL, 0C, 2A, 2AL, 2C } See "Functional Symbols"

7 Manual override options

Override option in solenoid end(s) only
Blank = Plain manual override
H = Water-resistant override on DC solenoids only
Z = No override

8 Solenoid identity method

V = Solenoid "A" at port A end of pilot valve; solenoid "B" at B end of pilot valve (German practice).
Omit for solenoid identity to USA ANSI B93.9 standard, i.e. energize solenoid "A" for P to A; solenoid "B" for P to B.

9 Solenoid connection type ■

U = ISO 4400 (DIN 43650) on coil ▼
FW = $^1/_2$" NPT thread conduit box
FTW= $^1/_2$" NPT thread conduit box and terminal strip
FJ = M20 thread conduit box
FTJ = M20 thread conduit box and terminal strip

■ *Other connection types as shown in catalog 2015 (DG4V-3/3S) may be made available depending on quantities.*
▼ *Female connector to be supplied by user.*

10 Indicator lights

Option for solenoid connection types F(T)W and F(T)J
L = Lights fitted
Omit if lights not required.For U type coil use plug with integral light, see nine pages on.

11 Coil rating

A = 110V AC
B▲ = 110V AC 50 Hz/120V AC 60 Hz
C = 220V AC 50 Hz
D▲ = 220V AC 50 Hz/240V AC 60 Hz
G = 12V DC
H = 24V DC

▲ *For 60 Hz or dual frequency.*

12 Design number

10 series for ECT models
30 series for ECT5 models
Subject to change. Installation dimensions unaltered for design numbers 10-19 and 30-39 respectively.

Operating Data

Typical with petroleum oil at 21 cSt (102 SUS) and at 50°C (122°F).	
Maximum pressures: Ports P, A, B and Vent Port T▲: ECT, 10 series ECT5, 30 series ▲ *Normally this is connected directly to the reservoir. Back pressure at port T is additive to the valve setting: if the back pressure exceeds system pressure by approx. 7 bar (100 psi), reverse flow T to P may occur.*	 250 bar (3625 psi) 250 bar (3625 psi) 100 bar (1450 psi) *ECT5, 30 series valves are designed to satisfy the needs of most applications. Consult your Vickers representative about an alternative model if:* *a) Valves are required to remain pressurized for long periods without frequent switching, and/or* *b) Back pressure at port T is required to rise above 100 bar (1450 psi).*
Pressure adjustment ranges	See "Model Code" 3
Maximum flow rates: ECT(5)-06 ECT(5)-10	 200 L/min (757 US gpm) 380 L/min (1440 US gpm)
Pressure override	See next page
Vent pressures	See next page
Vent flow	See next page
Response times, ECT5 models	See two pages on
Tank port leakage with valve closed. Valve set at max. pressure; pressure at port P = 50% of max. pressure. ECT(5)-**B ECT(5)-**C ECT(5)-**F	 <200 cm^3/min (12.2 in^3/min) <300 cm^3/min (18.3 in^3/min) <500 cm^3/min (30.5 in^3/min)
Thermal stability	See two pages on
Electrical Data for ECT5 Models	
Coil voltages	See "Model Code" 11
Permissible voltage fluctuation: Maximum Minimum	 See "Temperature Limits", three pages on 90% of rated voltage, see "Model Code" 11
Relative duty factor	Continuous, ED = 100%
Types of protection: ISO 4400 coils with plug fitted correctly Conduit box Coil winding Lead wires (coils type F**) Coil encapsulation	 IEC144, class IP65 IEC144, class IP65 Class H Class H Class F

Power consumption for coils listed in "Model Code" 11:	Initial◆ VA (rms)	Holding VA (rms)
AC coils:		
Types A, C at 50 Hz	225	39
Types B, D at 50 Hz	265	49
Types B, D at 60 Hz	260	48
DC coils:		
G	30W	–
H	30W	–

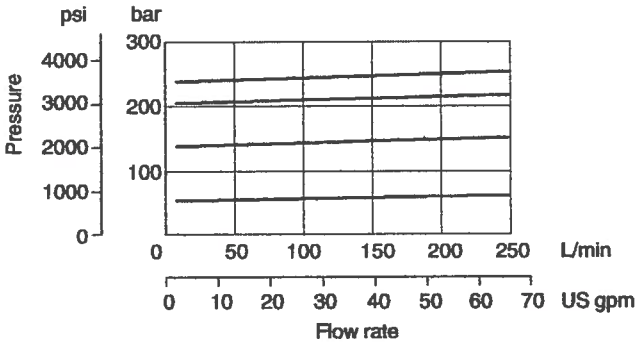
◆ *1st half cycle; solenoid armature fully retracted*

Performance Characteristics

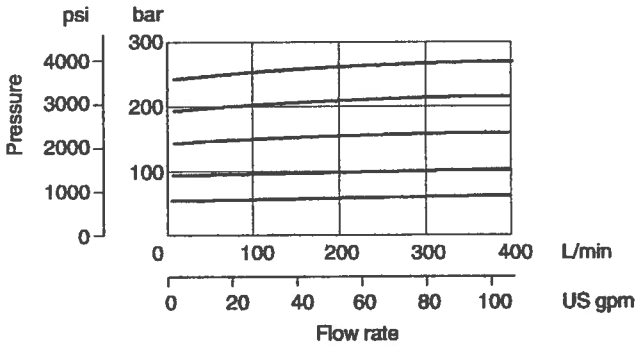
Typical with petroleum oil at 21 cSt (102 SUS) and at 50°C (122°F) unless stated otherwise.

Pressure Override at various settings

ECT(5)-06 models

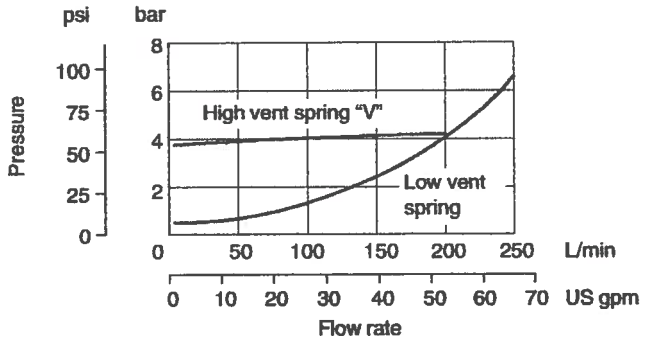


ECT(5)-10 models

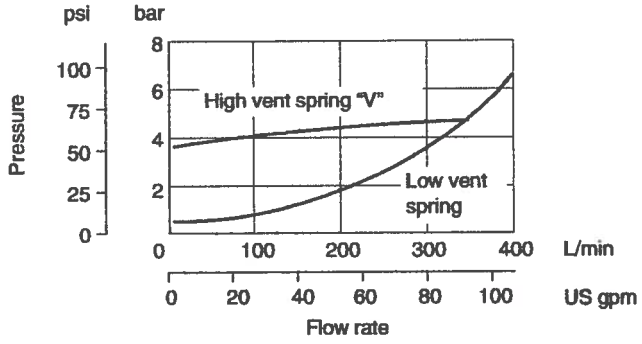


Vent Pressure Levels

ECT(5)-06 models

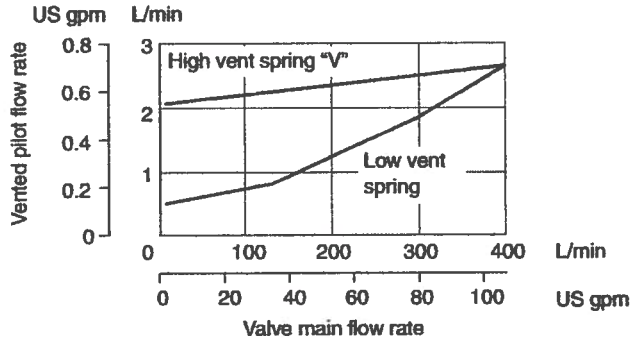


ECT(5)-10 models

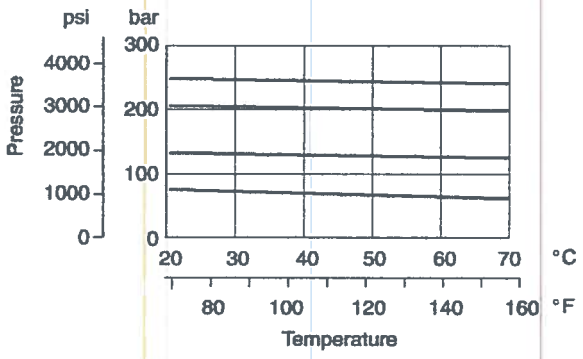


Vent Flow/Main Flow

Valid for ECT(5)-06 and -10 models

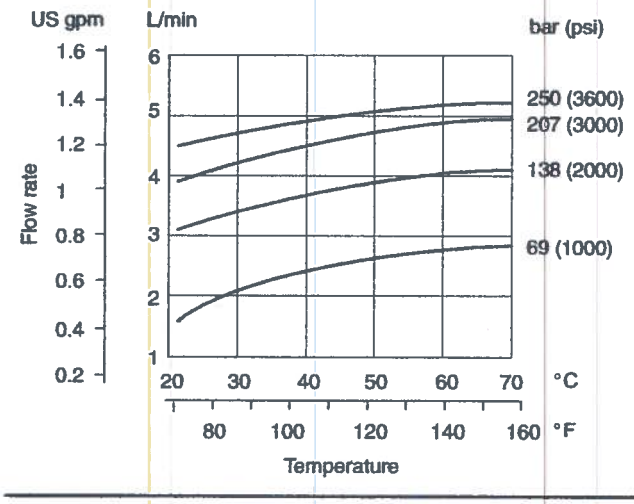


Thermal Stability
At various pressure settings and with flows:
ECT(5)-06 at 150 L/min (40 US gpm)
ECT(5)-10 at 300 L/min (80 US gpm)

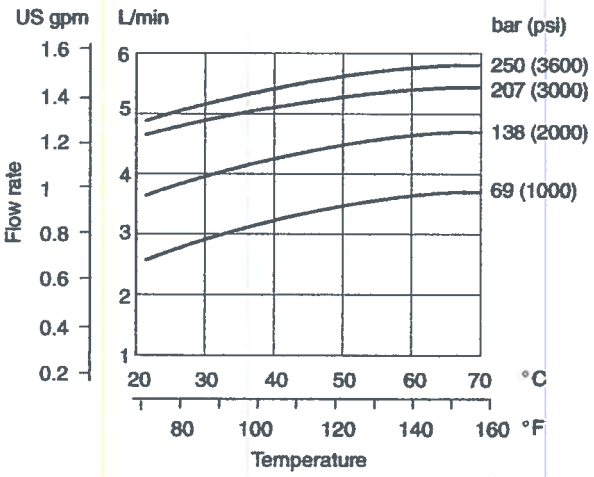


Under remote control conditions, vent line flow through pilot relief valve set at various pressures; main valves at maximum flow rates

ECT(5)-*** low vent pressure models



ECT(5)-***V high vent pressure models



Response Times, ECT5 Models
Approximate times for selecting remote and integral pressure settings from when a signal is first applied at the solenoid of an ECT5-***(V)-2** model.

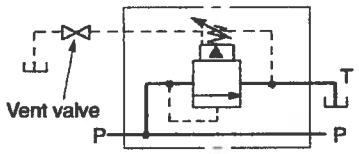
AC solenoids:
Energizing ..... 25 ms
De-energizing ..... 20 ms
DC solenoids:
Energizing ..... 50 ms
De-energizing ..... 25 ms ▲

▲ *In pure switched circuit conditions devoid of the effects of any suppression diodes and full-wave rectifiers.*

ECT5-***(V)-0** models (see "Functional Symbols") are slower when closing from the vented condition, ECT5-***V (high vent spring) models being faster than those without the "V" feature.

Control Methods

1. Manual adjustment of pressure setting
   For details see "Installation Dimensions" section.
2. Vent connection
   This connection allows a control valve to be placed in parallel with the pilot pressure stage of the valve. A suitable on/off valve can then be used to drop the system pressure to near-zero (or to the high vent pressure level), see diagram.



3. Remote control
   Alternatively a pilot relief valve can be connected in place of or after the on/off valve, to provide remote control of the ECT(5) pressure setting. Suitable pilot relief valves are Vickers models C-175 and CGR-02, described in catalogs 411 and 409 respectively.

For ECT5 models, control circuitry options can be extended by additional valves connected to ports A and B.

Hydraulic Fluids

All valves can be used with:
Antiwear hydraulic oils (class L-HM)
Invert emulsions (class L-HFB)
Water glycol (class L-HFC)
Phosphate ester (class L-HFD), adding "F3-" prefix at model code [1].

The extreme viscosity range is from 500 to 13 cSt (2270 to 70 SUS) but the recommended range is 54 to 13 cSt (245 to 70 SUS).

For further information about fluids see leaflet 920.

Temperature Limits

Minimum ambient ..... –20°C (–4°F)

Maximum ambient:
For ECT valves ..... 70°C (158°F)

For ECT5 valves with coils listed in model code [11] and at 110% of rated voltage:

Coil type and frequency	Max. ambient temperature
Dual frequency coils	
Types B and D at 50 Hz	65°C (150°F)
Types B and D at 60 Hz	65°C (150°F)
Single frequency (50 Hz) coils	
Types A and C at 50 Hz	65°C (150°F)
DC coils	
Types G and H	70°C (158°F)

Fluid Temperatures (all Models)

	Petroleum oil	Water-containing
Min.	–20°C (–4°F)	+10°C (50°F)
Max.*	+70°C (158°F)	+54°C (130°F)

* *To obtain optimum service life from both fluid and hydraulic system, 65° C (150° F) normally is the maximum temperature except for water-containing fluids.*

For synthetic fluids consult fluid manufacturer or Vickers representative where limits are outside those of petroleum oil.

Whatever the actual temperature range, ensure that viscosities stay within the limits specified in the "Hydraulic Fluids" section.

Contamination Control Requirements

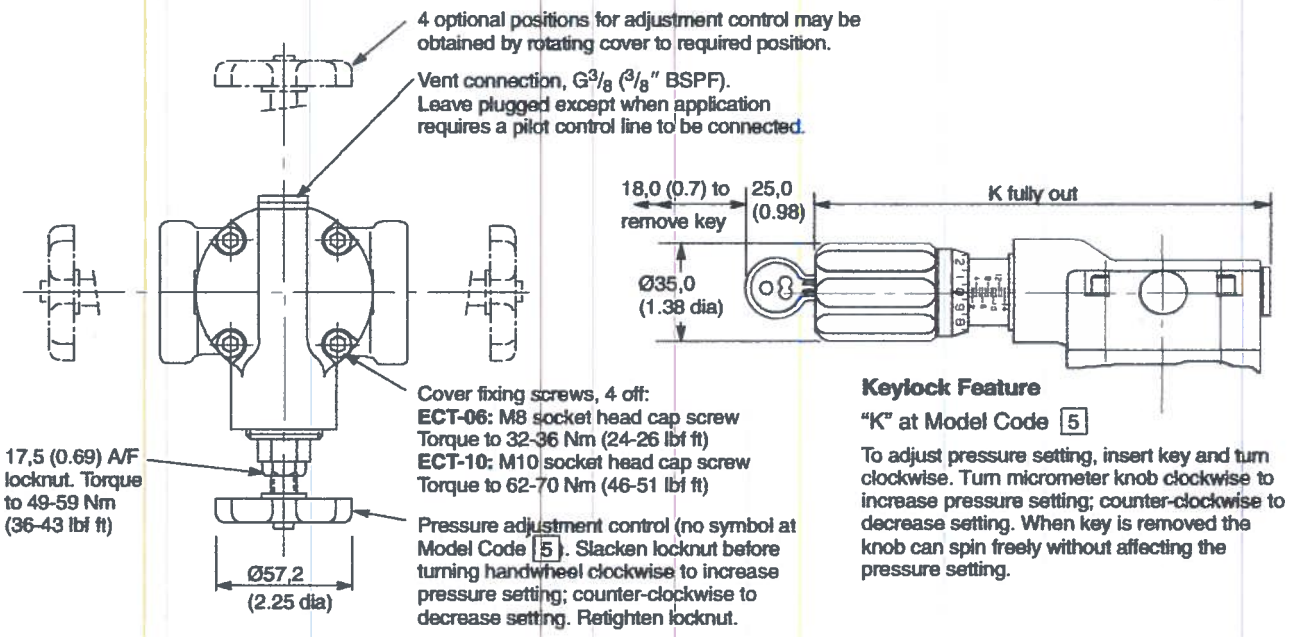
Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 9132 or 561, "Vickers Guide to Systemic Contamination Control". The book also includes information on the Vickers concept of "ProActive Maintenance". The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm. For products in this catalog the recommended levels are:

Up to 210 bar (3000 psi) 19/17/14
Above 210 bar (3000 psi) 19/17/14

Installation Dimensions in mm (inches)

ECT Models

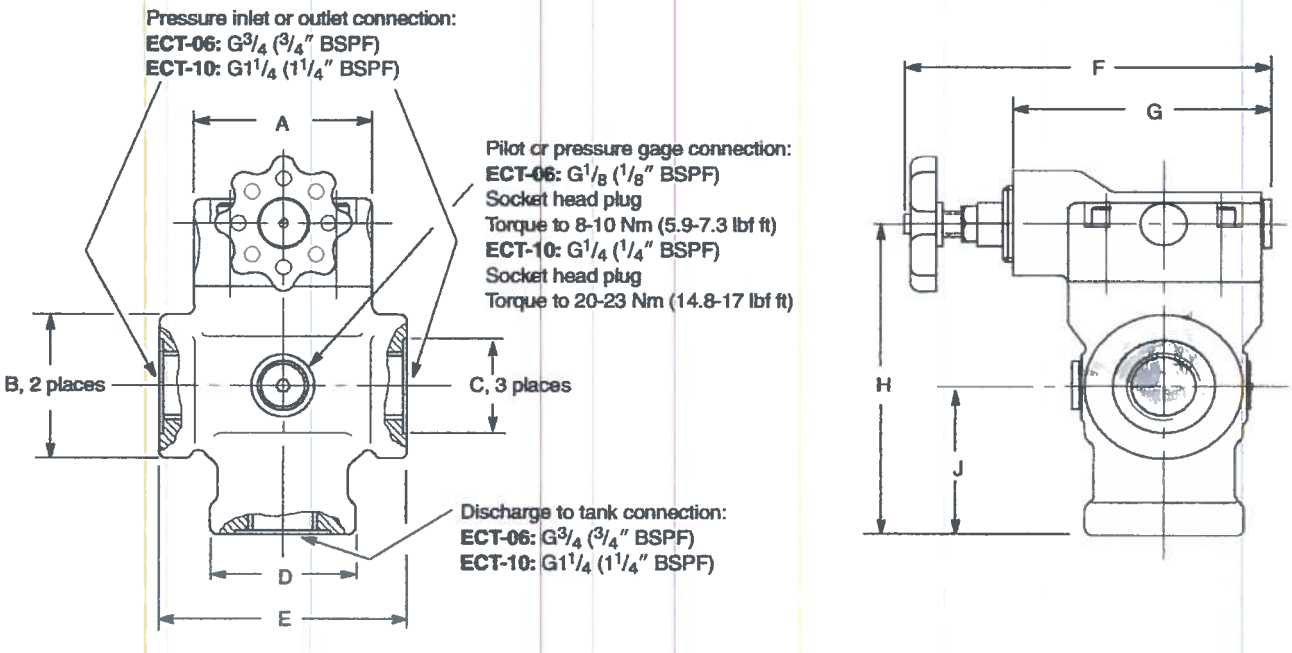
3rd angle projection


4 optional positions for adjustment control may be obtained by rotating cover to required position.
Vent connection, G3/8 (3/8" BSPF). Leave plugged except when application requires a pilot control line to be connected.
18,0 (0.7) to remove key
25,0 (0.98)
K fully out
Ø35,0 (1.38 dia)
Cover fixing screws, 4 off:
ECT-06: M8 socket head cap screw
Torque to 32-36 Nm (24-26 lbf ft)
ECT-10: M10 socket head cap screw
Torque to 62-70 Nm (46-51 lbf ft)
17,5 (0.69) A/F locknut. Torque to 49-59 Nm (36-43 lbf ft)
Pressure adjustment control (no symbol at Model Code 5). Slacken locknut before turning handwheel clockwise to increase pressure setting; counter-clockwise to decrease setting. Retighten locknut.
Ø57,2 (2.25 dia)

Keylock Feature

"K" at Model Code 5

To adjust pressure setting, insert key and turn clockwise. Turn micrometer knob clockwise to increase pressure setting; counter-clockwise to decrease setting. When key is removed the knob can spin freely without affecting the pressure setting.

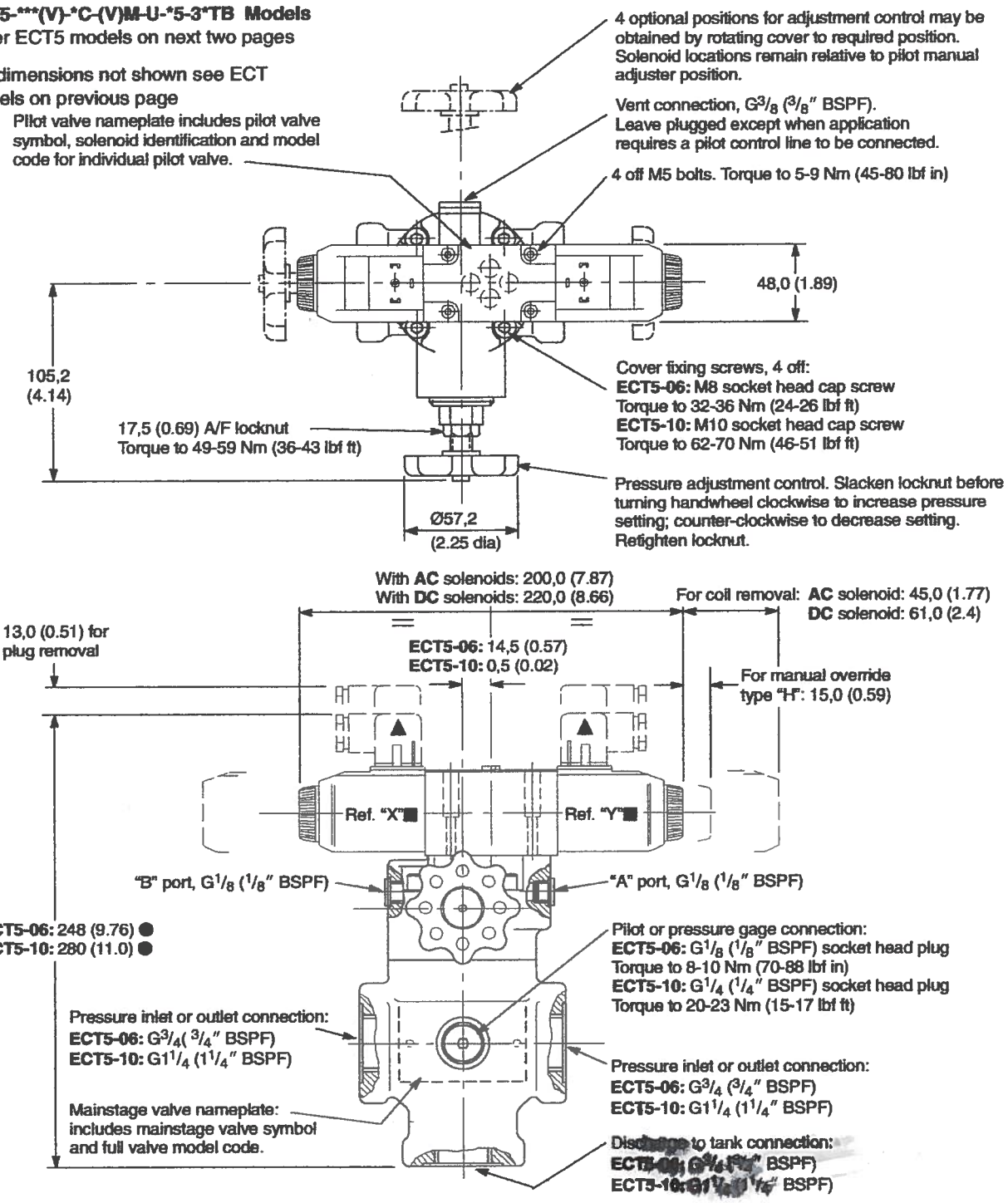


Model	A	B	C	D	E	F	G	H	J	K
ECT-06*(V)-(K)-10TB	77,7 (3.06)	57,2 (2.25)	42,0 (1.65)	63,5 (2.5)	106,4 (4.19)	146,0 (5.75)	103,0 (4.06)	133,3 (5.25)	63,5 (2.5)	179 (7.05)
ECT-10*(V)-(K)-10TB	95,3 (3.76)	76,2 (3.0)	56,0 (2.2)	76,2 (3.0)	124,0 (4.88)	155,5 (6.12)	112,5 (4.43)	163,6 (6.44)	76,2 (3.0)	189 (7.44)

ECT5 Models

ECT5-*(V)-*C-(V)M-U-*5-3*TB Models**
Other ECT5 models on next two pages

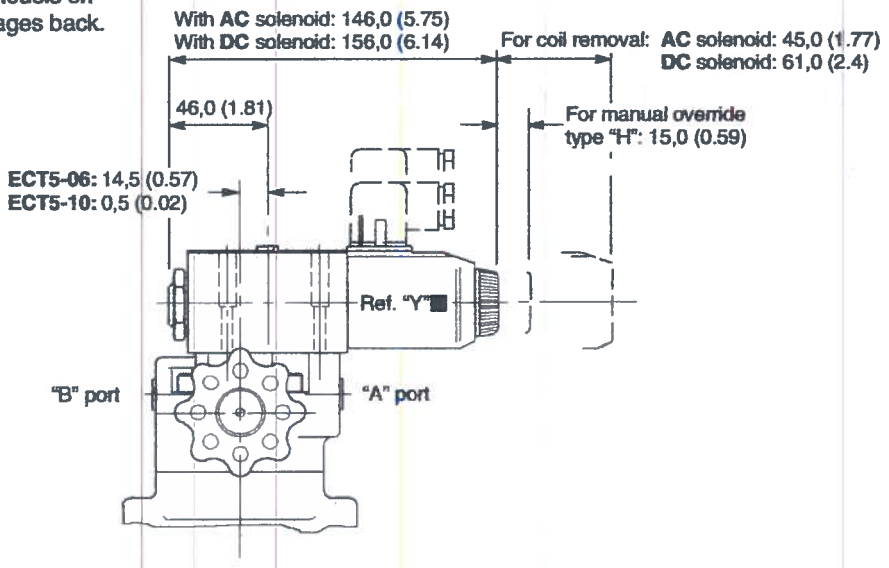
For dimensions not shown see ECT models on previous page


Pilot valve nameplate includes pilot valve symbol, solenoid identification and model code for individual pilot valve.
4 optional positions for adjustment control may be obtained by rotating cover to required position. Solenoid locations remain relative to pilot manual adjuster position.
Vent connection, G3/8 (3/8" BSPF). Leave plugged except when application requires a pilot control line to be connected.
4 off M5 bolts. Torque to 5-9 Nm (45-80 lbf in)
48,0 (1.89)
105,2 (4.14)
17,5 (0.69) A/F locknut Torque to 49-59 Nm (36-43 lbf ft)
Cover fixing screws, 4 off:
ECT5-06: M8 socket head cap screw Torque to 32-36 Nm (24-26 lbf ft)
ECT5-10: M10 socket head cap screw Torque to 62-70 Nm (46-51 lbf ft)
Pressure adjustment control. Slacken locknut before turning handwheel clockwise to increase pressure setting; counter-clockwise to decrease setting. Retighten locknut.
Ø57,2 (2.25 dia)
With AC solenoids: 200,0 (7.87)
With DC solenoids: 220,0 (8.66)
For coil removal: AC solenoid: 45,0 (1.77)
DC solenoid: 61,0 (2.4)
13,0 (0.51) for plug removal
ECT5-06: 14,5 (0.57)
ECT5-10: 0,5 (0.02)
For manual override type "H": 15,0 (0.59)
Ref. "X"■
Ref. "Y"■
"B" port, G1/8 (1/8" BSPF)
"A" port, G1/8 (1/8" BSPF)
ECT5-06: 248 (9.76) ●
ECT5-10: 280 (11.0) ●
Pilot or pressure gage connection:
ECT5-06: G1/8 (1/8" BSPF) socket head plug Torque to 8-10 Nm (70-88 lbf in)
ECT5-10: G1/4 (1/4" BSPF) socket head plug Torque to 20-23 Nm (15-17 lbf ft)
Pressure inlet or outlet connection:
ECT5-06: G3/4(3/4" BSPF)
ECT5-10: G1 1/4 (1 1/4" BSPF)
Pressure inlet or outlet connection:
ECT5-06: G3/4 (3/4" BSPF)
ECT5-10: G1 1/4 (1 1/4" BSPF)
Mainstage valve nameplate: includes mainstage valve symbol and full valve model code.
Discharge to tank connection:
ECT5-06: G3/4 (3/4" BSPF)
ECT5-10: G1 1/4 (1 1/4" BSPF)

● *May vary according to plug source.*
■ *See "Solenoid Identities", two pages on.*
▲ *Plug not supplied; order separately if required. For available plug types see section "Electrical Plugs and Connectors".*

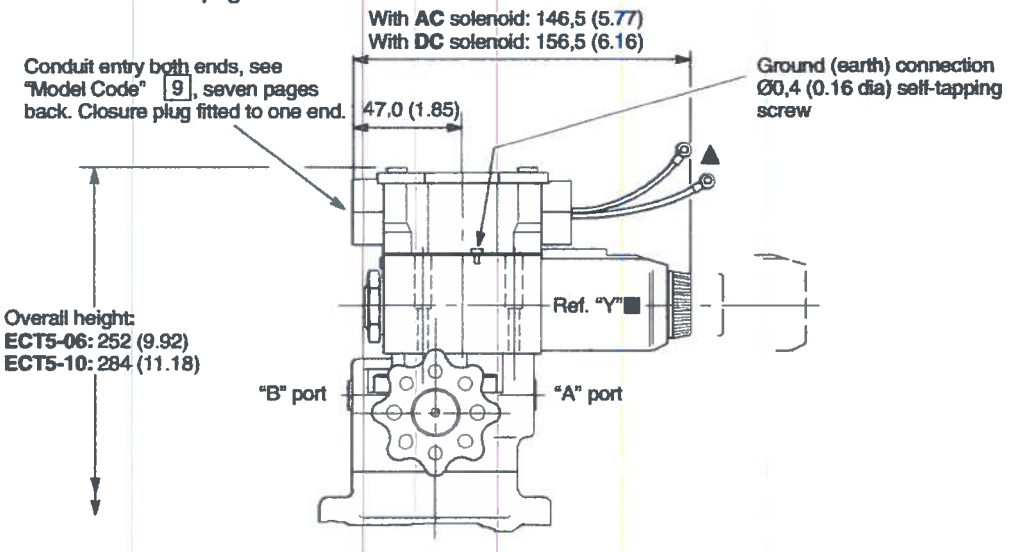
ECT5-*(V)(-K)-*A/B(L)(-*)-(V)M-U-*5-3*TB Models**
ECT5-***(V)-*A/B(-*)-(V)M-U-*5-3*TB example

For dimensions not shown see ECT5 models on previous page and ECT models two pages back.



ECT5-*(V)(-K)-*A/B(L)(-*)-(V)M-FJ(L)-*5-3*TB Models**
ECT5-*(V)(-K)-*A/B(L)(-*)-(V)M-FW(L)-*5-3*TB Models**
ECT5-***(V)-*A/B(-*)-(V)M-FJ/W-*5-3*TB example

For dimensions not shown see ECT5 models on previous page and ECT models two pages back.

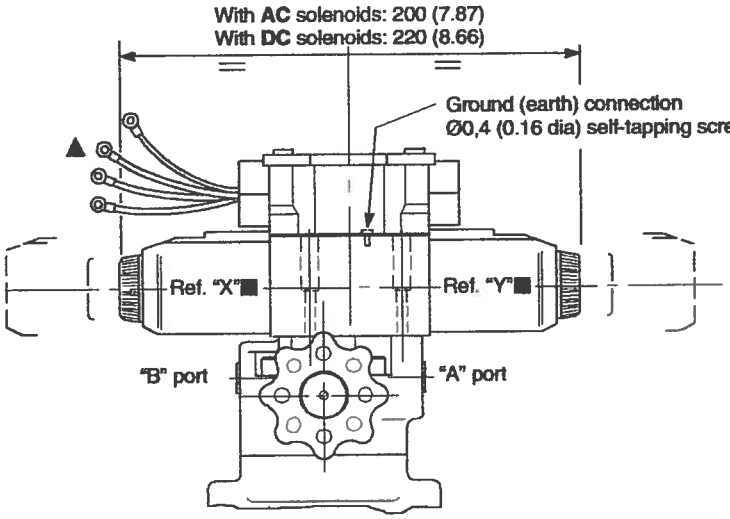

With AC solenoid: 146,5 (5.77)
With DC solenoid: 156,5 (6.16)
Conduit entry both ends, see "Model Code" 9, seven pages back. Closure plug fitted to one end.
47,0 (1.85)
Ground (earth) connection Ø0,4 (0.16 dia) self-tapping screw
Overall height:
ECT5-06: 252 (9.92)
ECT5-10: 284 (11.18)
Ref. "Y"■
"B" port
"A" port

■ *For ECT5-***(V)(-K)-*AL/BL models the pilot valve solenoid and body end plug are interchanged from as shown. The solenoid reference then becomes "Ref. X". See "Solenoid Identities" next page.*

▲ *Ref. Model Code 9:*
Codes "FJ" and "FW": 2 lead wires for each solenoid, approx 150 (6.0) long. M3 terminals provided for customer connection.
Codes "FTJ" and "FTW": lead wires connected into terminal strip suitable for M3 terminals on customer connection.

ECT5-*(V)(-K)-*C(-*)-(V)M-FJ(L)-*5-3*TB Models**
ECT5-*(V)(-K)-*C(-*)-(V)M-FW(L)-*5-3*TB Models**
ECT5-***(V)-*C(-*)-(V)M-FJ/W-*5-3*TB example

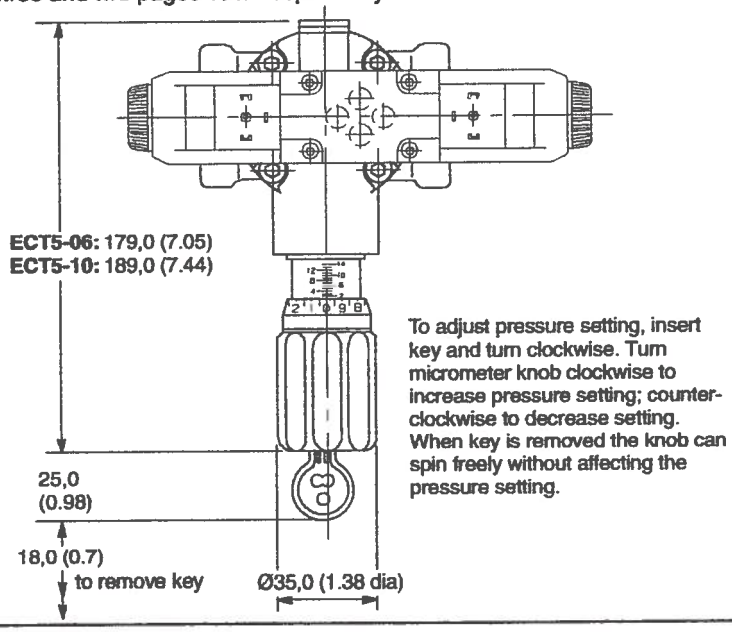
For dimensions not shown see ECT and ECT5 models three and two pages back respectively.



■ *See "Solenoid Identities" this page.*
▲ *Ref. Model Code [9]:*
Codes "FJ" and "FW": 2 lead wires for each solenoid approx 150 (6.0) long. M3 terminals provided for customer connection.
Codes "FTJ" and "FTW": lead wires connected into terminal strip suitable for M3 terminals on customer connection.

ECT5-*(V)-K-**(L)(-*)-(V)M-***(L)-*5-3*TBModels**
ECT5-***(V)-K-**(L)(-*)-(V)M-U-*5-3*TB example

For dimensions not shown see ECT and ECT5 models three and two pages back respectively.



To adjust pressure setting, insert key and turn clockwise. Turn micrometer knob clockwise to increase pressure setting; counter-clockwise to decrease setting. When key is removed the knob can spin freely without affecting the pressure setting.

Solenoid Identities
The solenoid identity ("Sol. A"/Sol. B") is printed on the nameplate of the pilot valve of ECT5 models.

For ANSI/NFPA standard, no symbol at model code [8]:

Spool/spring code at model code [6]	Solenoid identity Ref. X	Ref. Y
0B	–	B
0BL	A	–
0C	A	B
2A	–	B
2AL	A	–
2C	A	B

For German practice, "V" at model code [8]:

Spool/spring code at model code [6]	Solenoid identity Ref. X	Ref. Y
0B	–	A
0BL	B	–
0C	B	A
2A	–	A
2AL	B	–
2C	B	A

Electrical Plugs and Connectors

Plugs for ISO 4400 (DIN 43650) Type Coil Connection

For valves with type "U" coils (model code [9]).

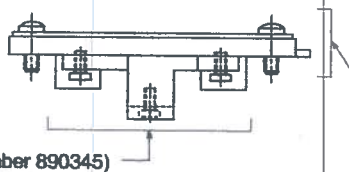
The cable entry on these plugs can be repositioned at 90° intervals by re-assembly of the contact holder relative to the plug housing. The cable entry is Pg11 for cable Ø 6-10 mm (0.24 to 0.39" dia).

Order plugs separately by part number.

Voltage	Part number Gray (Sol. A)	Black (Sol. B)
Without indicator light		
–	710776	710775
With indicator light		
12- 24V	977467	977466
100-125V	977469	977468
200-240V	977471	977470

Terminal Strip and Lights

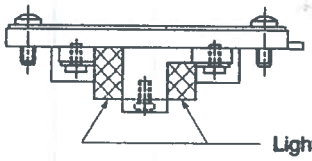
For "FTJ" or "FTW" at model code [9]



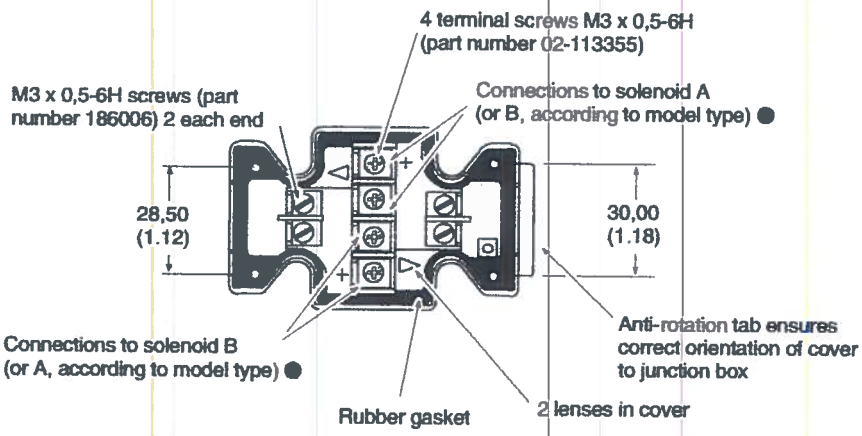
Terminal strip (part number 890345) clips to cover and can be field-fitted

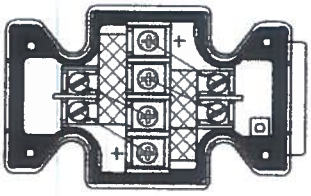
Conduit box cover and nameplate complete with sealing gasket and 4 screws

For "FTJL" or "FTWL" at model code [9] + [10]



Lights


4 terminal screws M3 x 0,5-6H (part number 02-113355)
M3 x 0,5-6H screws (part number 186006) 2 each end
Connections to solenoid A (or B, according to model type) ●
28,50 (1.12)
30,00 (1.18)
Connections to solenoid B (or A, according to model type) ●
Anti-rotation tab ensures correct orientation of cover to junction box
Rubber gasket
2 lenses in cover



● *1. For DC coils the +ve lead(s) must be connected to the terminal(s) marked +. When using 3-wire incoming leads to double solenoid valves (i.e. common neutral) the inner pair of terminals must be linked.*

2. For correct light indication of energized solenoid ensure that solenoid leads are correctly connected: light terminals are common with each outer pair of solenoid terminals according to the side with + mark.

Installation Data

Mounting attitude: unrestricted.

Mass (approx.), kg (lb)

ECT-06 ..... 4,5 (9.9)
ECT-10 ..... 9,1 (20.0)

ECT5 models	AC sol.	DC sol.
ECT5-06 with single solenoid	6,5 (14.3)	6,7 (14.7)
ECT5-06 with double solenoid	6,9 (15.2)	7,4 (16.3)
ECT5-10 with single solenoid	9,6 (21.1)	9,8 (21.6)
ECT5-10 with double solenoid	10,0 (22.0)	10,5 (23.1)

Ordering Procedure

Specify valves by full model code; plugs by part number.

1. EET-5-06-E-0J
4SYX

2. EET-5-10-E-0J

3

Vickers®

Pressure Relief

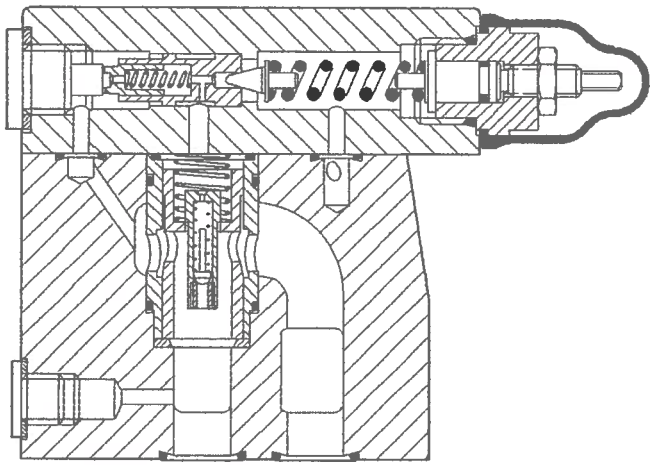
EATON

Pressure Reducing Valves

X(C)G2V-6/8, 10 Series

Typical Section

X(C)G2V-***-1* valve



Basic Characteristics

Max. inlet pressure ..... 350 bar (5000 psi)
Max. reduced pressure ..... 330 bar (4780 psi)
Maximum flow .. 300 L/min (80 USgpm)
Mounting face to ISO 5781
(B port high pressure inlet):
X(C)G2V-6 ..... AG-06-2-A
X(C)G2V-8 ..... AH-08-2-A

General Description

Where sections of an hydraulic system are required to operate at a pressure below that of the general system, it is frequently more convenient to use a pressure reducing valve than to add further pump sections.

These two-stage pressure reducing valves allow full flow from inlet to outlet port until the reduced pressure setting is reached, whereupon the outlet flow is closed off. Reduced pressure setting is manually adjustable at the pilot stage. Five ranges of reduced pressure adjustment are available.

High valve response ensures that the reduced outlet pressure is unaffected by inlet pressure peaks. Excessive build-up of outlet port pressure (e.g. caused by flow back from an actuator) is prevented by the small check in the main-stage which connects the outlet port to the pilot stage.

For applications where full reverse flow is required an optional integral check valve is available (model types XCG).

Models with electrohydraulic proportional control, types KX(C)GV, are described in catalog 2322.

Features and Benefits

- Close matching to machine requirements with choice of five adjustment ranges of reduced pressure.
- Excellent repeatability and stable performance results from cartridge design of main-stage parts.
- Minimal pump flow losses when using several valves in parallel, results from design of internal pilot system.
- Free reverse flow from integral check valve option.
- International mounting surfaces.
- Low installed cost and space requirement from high power/size ratios (more than double that of many conventional designs).

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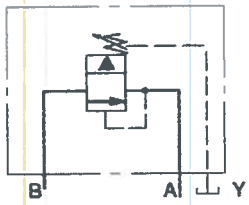
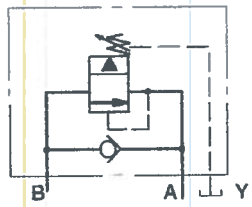
GB-2321A

Functional Symbols

XG2V model (no reverse flow check)



XCG2V model (integral check valve for free flow A to B)



Model Code

For valves with manual adjustment only

(F3-)X(C)G2V-* * * -1*

1 2 3 4 5 6

1 Fluid compatibility

Blank = Anti-wear hydraulic oil (class L-HM), invert emulsion (class L-HFB) or water glycol (class L-HFC)

F3 = As above or phosphate ester (class L-HFD)

2 Integral check valve (free reverse flow)

C = Integral check valve

Omit if not required

3 Mounting surface, ISO 5781

With B port, high pressure inlet and A port, reduced pressure outlet

6 = Size 06

8 = Size 08

4 Reduced pressure adjustment control range

A = 2 to 35 bar (30 to 500 psi)

B = 5 to 70 bar (44 to 1000 psi)

C = 5 to 140 bar (44 to 2000 psi)

F = 5 to 210 bar (44 to 3000 psi)

G = 5 to 330 bar (44 to 4780 psi)

5 Type of manual adjustment

K = Micrometer with keylock

M = Micrometer without keylock

W = Screw/locknut

6 Design number, 1* series

Subject to change. Installation dimensions unaltered for design numbers 10-19 inclusive.

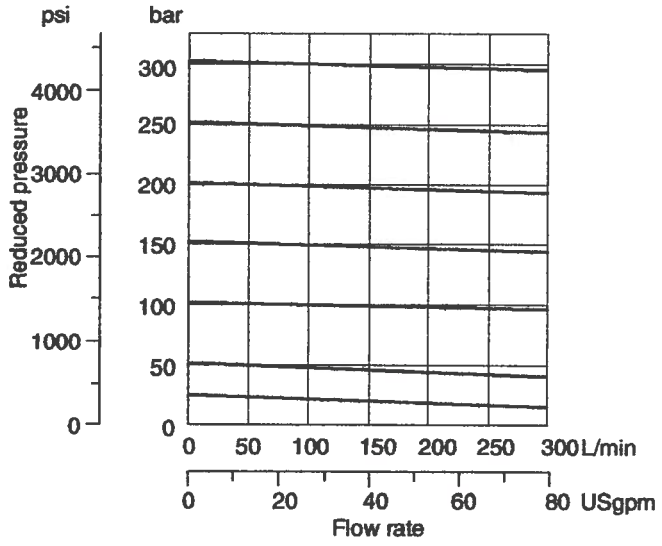
Operating Data

Data is typical with oil at 22 cSt (106 SUS) and at 50°C (122°F).

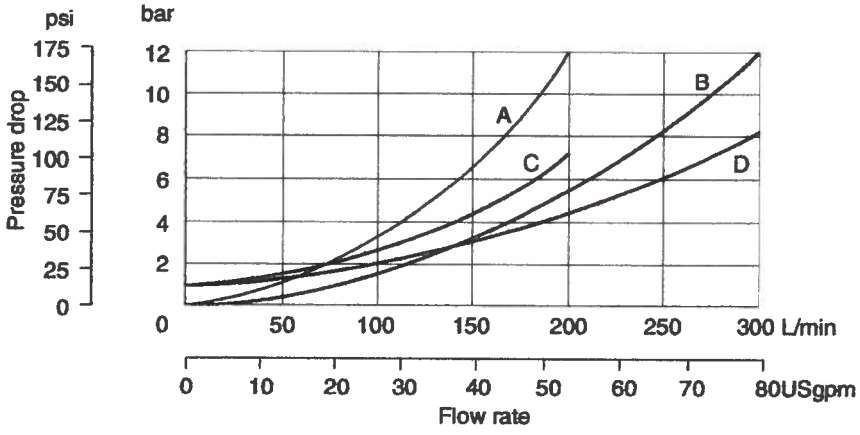
Maximum pressures: Port B (pressure inlet) Port A (reduced pressure outlet) Port Y■	 350 bar (5000 psi) See model code position 4 2 bar (30 psi)
Rated flow rates at Δp = 12 bar (175 psi): X(C)G2V-6 X(C)G2V-8	 200 L/min (53 USgpm) 300 L/min (80 USgpm)
Pressure adjustment ranges	See model code position 4
Minimum pressure differential (P_B - P_A) for effective reduced pressure control, all models	20 bar (300 psi) approx.
Pilot control drain flow, all models at P_B 100 bar (1450 psi) at P_B 300 bar (4350 psi)	 1,0 L/min (0.26 USgpm) 1,3 L/min (0.34 USgpm)
Hydraulic fluids and fluid temperatures	See page 3
Temperature limits	See page 3
Mass	See page 6
Spare parts/service information	40630

■ *Back pressure at this port is additive to the reduced pressure setting of the valve.*

Pressure Underride
X(C)G2V-8 examples



Pressure Drop



From port B to A at pressures below reduced pressure setting:
X(C)G2V-6 ..... Curve A
X(C)G2V-8 ..... Curve B

From port A to B through check valve (main stage assumed closed), XCG2V models only:
XCG2V-6 ..... Curve C
XCG2V-8 ..... Curve D

Hydraulic Fluids
All valves can be used with:
Anti-wear hydraulic oils (class L-HM)
Invert emulsions (class L-HFB)
Water glycol (class L-HFC)
Phosphate ester (class L-HFD), adding "F3-" prefix at model code .1

The extreme viscosity range is from 500 to 13 cSt (2270 to 70 SUS) but the recommended range is 54 to 13 cSt (245 to 70 SUS).

For further information about fluids see catalog 694.

Temperature Limits
Ambient:
Min. ..... –20°C (–4°F)
Max. ..... 70°C (158°F)

Fluid temperature:
Min. ..... –20°C (–4°F)
Max.* ..... 70°C (158°F)

* *To obtain optimum service life from both fluid and hydraulic system, 65°C (150°F) normally is the maximum temperature except for water-containing fluids.*

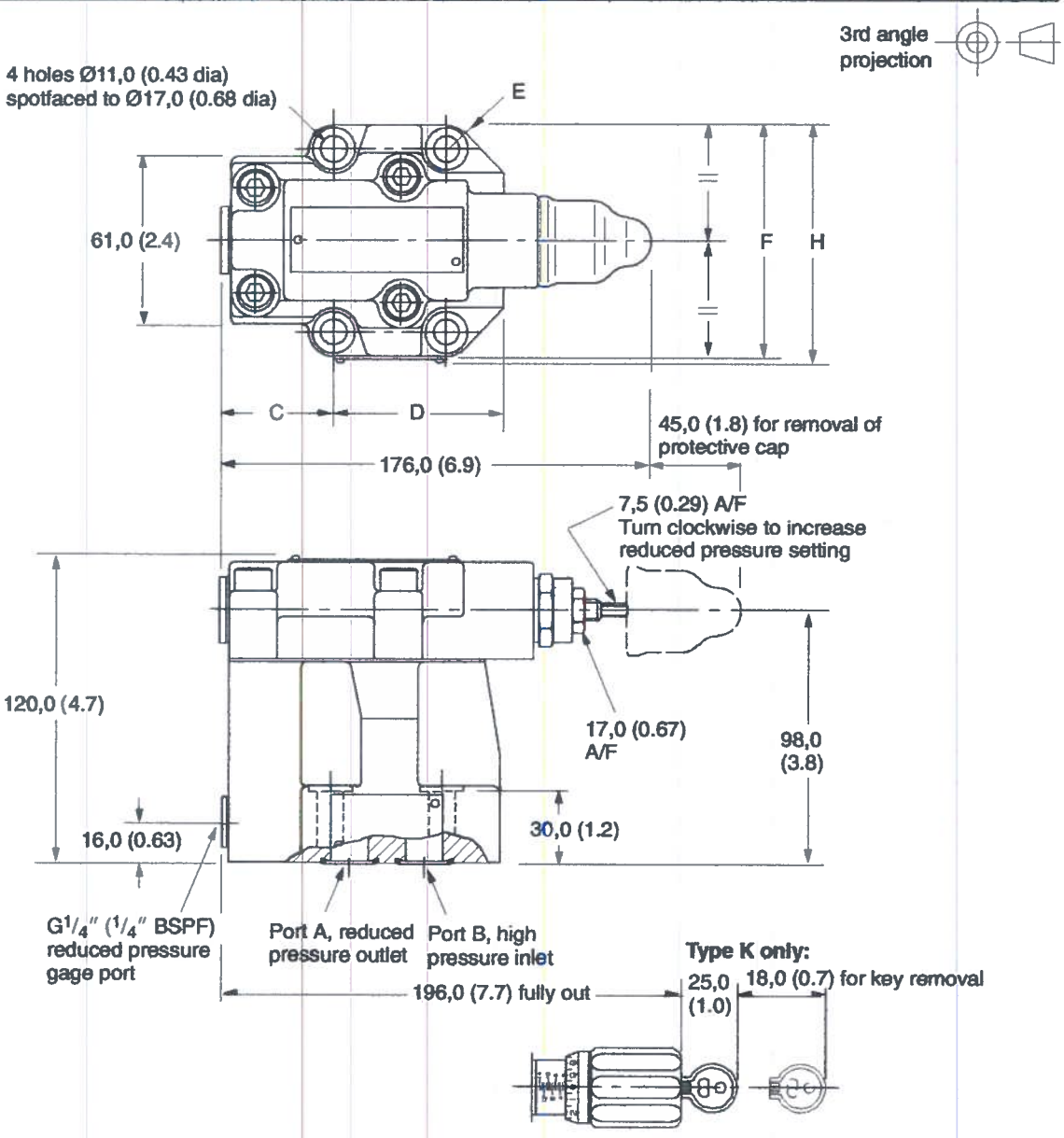
For synthetic fluids consult fluid manufacturer or Vickers representative where limits are outside those of petroleum oil.

Whatever the actual temperature range, ensure that viscosities stay within the limits specified in the "Hydraulic Fluids" section.

Contamination Control Requirements
Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 561, "Vickers Guide to Systemic Contamination Control". The book also includes information on the Vickers concept of "ProActive Maintenance". The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm. For products in this catalog the recommended levels are:

Up to 210 bar (3050 psi) 19/17/14
Above 210 bar (3050 psi) 19/17/14

Installation Dimensions in mm (inches)



Model	C	D	E	F	H
X(C)G2V-6	42,0 (1.7)	66,0 (2.6)	10,0 (0.4)	89,0 (3.5)	92,0 (3.65)
X(C)G2V-8	40,0 (1.6)	77,0 (3.1)	11,0 (0.43)	104,0 (4.1)	107,0 (4.25)

Micrometer Adjustment Options: "K" or "M" in Model Code [5]

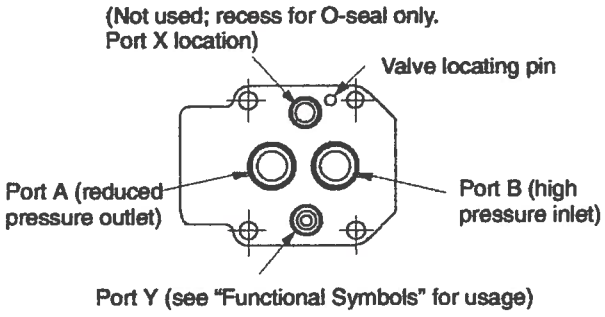
"K" Feature

To adjust pressure setting, insert key and turn clockwise. Turn micrometer knob clockwise to increase pressure setting; counter-clockwise to decrease setting.

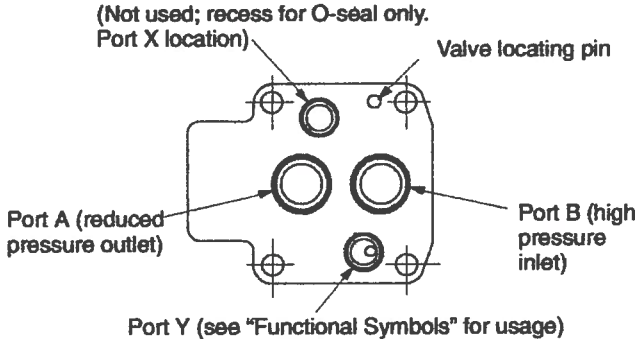
When the key is removed, the knob can spin freely without affecting the pressure setting.

Views on Bottom Face of Valves (See also "Mounting Surfaces", page 6. All O-seals supplied).

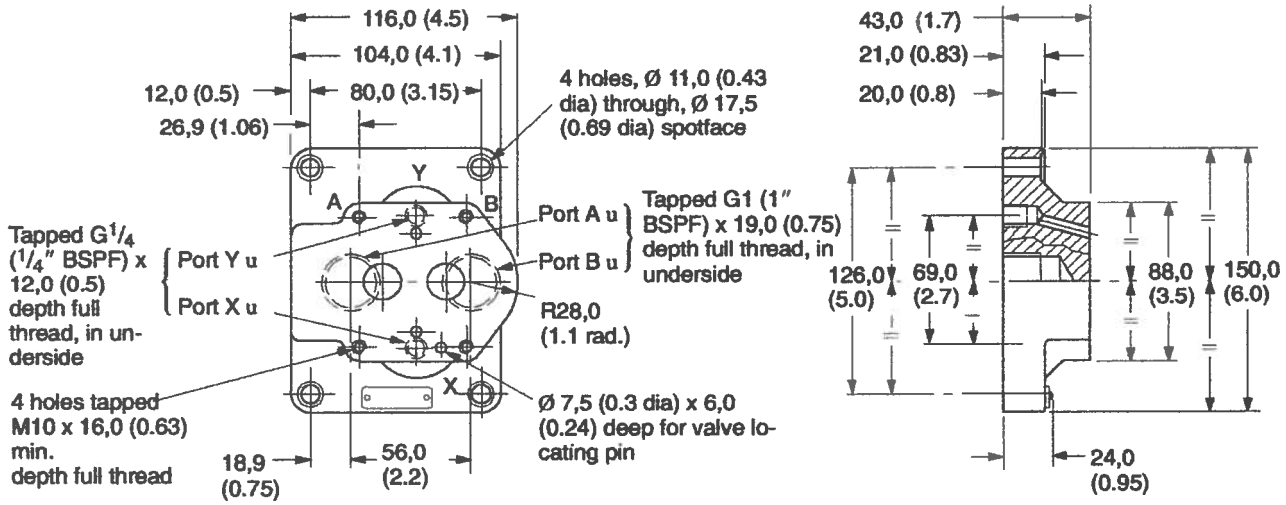
X(C)G2V-6


(Not used; recess for O-seal only.
Port X location)
Valve locating pin
Port A (reduced pressure outlet)
Port B (high pressure inlet)
Port Y (see "Functional Symbols" for usage)

X(C)G2V-8


(Not used; recess for O-seal only.
Port X location)
Valve locating pin
Port A (reduced pressure outlet)
Port B (high pressure inlet)
Port Y (see "Functional Symbols" for usage)

XCGVM-6-10R Subplate

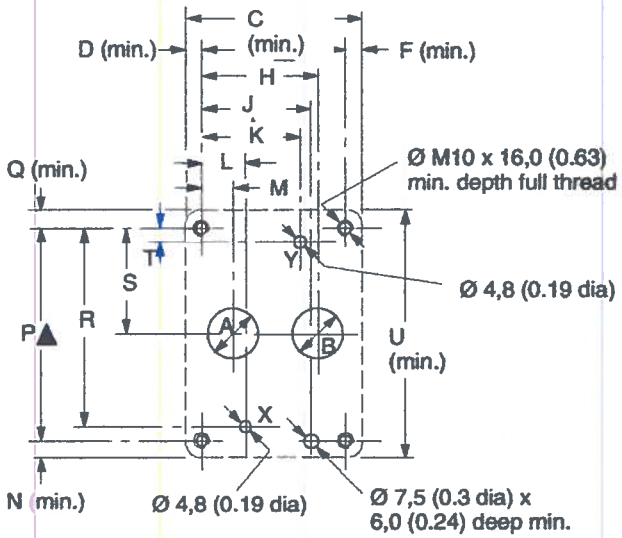


▲ *See "Mounting Surfaces" section on next page for port usage.*

Mounting Surfaces, Based on ISO 5781 Codes:
AG-08-2-A
AH-08-2-A

When a subplate is not used a raised machined pad must be provided for mounting. The pad must be flat within 0,01mm/100 mm (0.001"/10") and smooth within 0,8 µm (32 µin). Dimensional tolerances are ±0,2 mm (0.008") except where indicated.

Port functions
A = Reduced pressure outlet (also free reverse flow inlet for XCG2V valves)
B = High pressure inlet (also free reverse flow outlet for XCG2V valves)
X = Not used for X(C)G2V valves; can be omitted or plugged
Y = Drain port



Size	A dia.	B dia.	C	D	E	F	H	J	K
06	14,7 (0.58)	14,7 (0.58)	61,0 (2.4)	9,0 (0.4)	42,9 (1.69)	9,0 (0.4)	35,7 (1.4)	31,8 (1.25)	21,4 (0.84)
08	23,4 (0.92)	23,4 (0.92)	78,0 (3.1)	8,8 (0.35)	60,3 (2.37)	8,8 (0.35)	49,2 (1.94)	44,5 (1.75)	39,7 (1.56)

Size	L	M	N	P	Q	R	S	T	U
06	21,4 (0.84)	7,1 (0.28)	10,0 (0.4)	66,7 (2.62)	10,0 (0.4)	58,7 (2.3)	33,3 (1.3)	7,9 (0.31)	87,0 (3.4)
08	20,6 (0.81)	11,1 (0.44)	10,8 (0.43)	79,4 (3.125)	10,8 (0.43)	73,0 (2.87)	39,7 (1.56)	6,4 (0.25)	101,0 (4.0)

▲ *Tolerance on bolt and pin locations ±0,1 mm (0.004").*

Installation Data

Mounting attitude unrestricted

Subplates

For X(C)G2V-6 valves see type XCGVM-6-10R, on page 5.
For X(C)G2V-8 valves consult your Vickers representative.

Mounting Bolts/Torques
For all models, bolt kit BKXG2V-6. Bolts should be torqued to 59-73 Nm (44-53 lbf ft), with threads lubricated.

Mass

X(C)G2V-6 valves ..... 4,8 kg (10.6 lb)
X(C)G2V-8 valves ..... 5,6 kg (12.4 lb)

Ordering Procedure

All valves, subplates, bolt kits should be ordered by full model code designation.

Vickers®

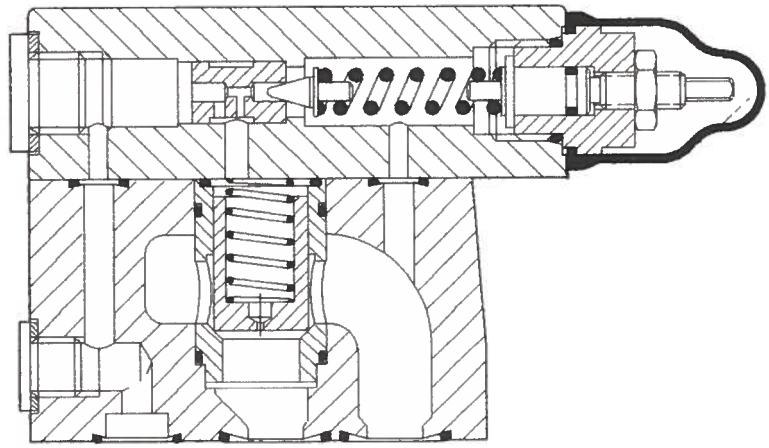
Pressure Relief

Pressure Relief and Sequence Valves

CG2V-6/8, 10 Series; CG5V-6/8, 20 Series

Typical Section

CG2V-6*W-10 relief valve



Basic Characteristics

Maximum pressure ..... 350 bar (5000 psi)
Maximum flow ..... 400 L/min (106 USgpm)
Mounting face to ISO 6264:
CG*V-6 valves AR-06-2-A
CG*V-8 valves AS-08-2-A

General Description

These two-stage valves are used to limit or control pressure by directing up to the total system fluid flow to reservoir when system pressure reaches the setting of the valve. System actuators are thus protected against overload.

Each relief valve incorporates a vent port that can be connected to a separate pilot control valve to remotely control or unload system pressure.

Two types of valve are presented in this catalog:

- CG2V-***, 10 series: relief/sequence valve with integral manual adjustment of pressure setting.
- CG5V-***, 20 series: relief valve with solenoid operated pilot valve for loading/unloading.

A third type, KCG-*, 10 series, with proportional pilot control valve, is described in catalog 2324.

Features and Benefits

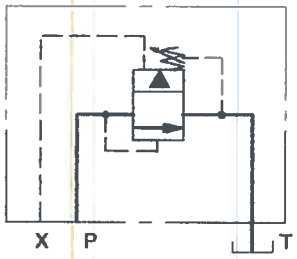
- Close matching to application requirements from choice of four adjustment control ranges covering 3 to 350 bar (44 to 5000 psi).
- Electrical on/off load from solenoid controlled models.
- Remote parallel control by other pilot valves connected to "vent" port.
- High machine productivity resulting from full system flow being available for work output until system pressure is very close to valve setting.
- Pressure override optimized without detriment to other performance parameters.
- Excellent repeatability and stable performance from cartridge-type design of mainstage parts.
- Low off-load power wastage.
- International mounting interfaces.
- Low installed cost and space requirement from high power/size ratios (more than double that of many conventional designs).

VICKERS
February 1996

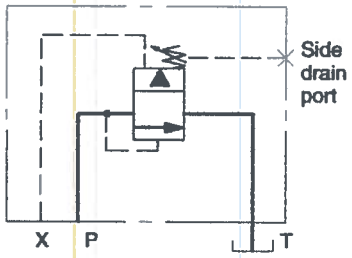
GB-2323A

Functional Symbols

Relief valve, manually adjusted, CG2V-***-1* model

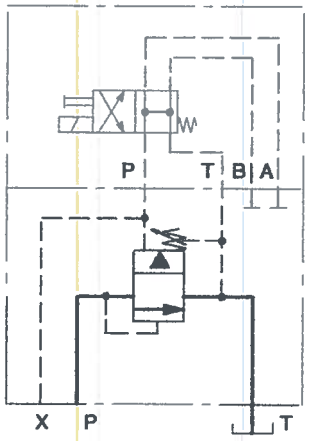


Sequence valve, manually adjusted, CG2V-***-1-1* model▲



▲ *If a valve with an integral, reverse free-flow check is required, use a type RCG valve, as in catalog 429.*

Solenoid controlled relief valve, pilots internally drained, CG5V-***-D-2* model



Model Codes

For Valves with Manual Adjustment Only

(F3-) CG2V-* * * (-1)-1*

1 | 2 3 4 | 5 | 11

For Valves with Manual Adjustment Plus Electrical Load/Unload

(F3-) CG5V-* * * -D(-*)- (V) M- * (-L) - * 5-2***

1 | 2 3 4 | 6 | 7 | 8 | 9 | 10 | 11

1 Fluid compatibility

Blank = Antiwear hydraulic oil (class L-HM), invert emulsion (class L-HFB) or water glycol (class L-HFC)

F3 = As above or phosphate ester (class L-HFD)

2 Mounting surface, ISO 6264

6 = AR-06-2-A

8 = AS-08-2-A

3 Pressure adjustment control range

B = 3 to 70 bar (44 to 1000 psi)

C = 3 to 140 bar (44 to 2000 psi)

F = 3 to 210 bar (44 to 3000 psi)

G = 3 to 350 bar (44 to 5000 psi)

4 Type of manual adjustment

K = Micrometer with keylock

M = Micrometer without keylock

W = Screw/locknut

5 Drain options

1 = External drain from side port: CG2V sequence-version (see "Functional Symbols")

Omit for CG2V relief-version and for CG5V models

6 Manual override options, CG5V only

Override in solenoid end

Blank = Plain override

H = Water-resistant override, DC solenoid only

Z = No override

7 Solenoid energization identity, CG5V only

V = Solenoid "A" at port A end of pilot valve (energizing "A" connects P to B pilot ports): German practice.

Omit for solenoid identity "B" (energizing "B" connects P to B pilot ports): USA ANSI B93.9/ NFPA standard.

8 Solenoid connection type▲, CG5V only

U = ISO 4400 (DIN 43650)◆

FW = $^1/_2$" NPT thread conduit box

FTW= $^1/_2$" NPT thread conduit box and terminal strip

FJ = M20 thread conduit box

FTJ = M20 thread conduit box and terminal strip

▲ *Other connection types as shown in catalog 2015 (DG4V-3/3S) may be made available depending on quantities.*

◆ *Female connector to be supplied by user.*

9 Indicator lights, CG5V only

Option for solenoid connection types FTW and FTJ, see position 8

L = Lights fitted

Omit if lights not required

For U-code solenoid, use plug with integral light, see "Electrical Plugs and Connectors"

10 Coil rating, CG5V only

See "Operating Data" for further information

A = 110V AC 50 Hz
B■ = 110V AC 50 Hz/120V AC 60 Hz
C = 220V AC 50 Hz
D■ = 220V AC 50 Hz/240V AC 60 Hz
G = 12V DC
H = 24V DC

■ *For 60 Hz or dual frequency.*

11 Design number

10 series for CG2V valves
20 series for CG5V valves
Subject to change. Installation dimensions unaltered for design numbers 10-19 and 20-29 inclusive.

Operating Data

Data is typical with oil at 22 cSt (106 SUS) and at 50°C (122°F)

Maximum pressures: Ports P and X Port T▲: CG2V valves, 10 series CG5V valves, 20 series ▲ *For relief valves this is normally connected directly to reservoir because back pressure here adds to the effective setting of the valve.*	 350 bar (5000 psi) 350 bar (5000 psi) 100 bar (1500 psi) *CG5V, 20 series valves are designed to satisfy the needs of most applications. Consult your Vickers representative about an alternative model if:* *a) Valves are required to remain pressurized for long periods without frequent switching, and/or* *b) Back pressure on port T is required to rise above 100 bar (1500 psi).*
Pressure adjustment ranges	See model code 3
Maximum flow rates: CG*V-6 CG*V-8	 200 L/min (53 USgpm) 400 L/min (106 USgpm)
Vent ▼ flow, port X, when used ▼ *See "Vent Function" explanation two pages on.*	3 L/min (0.8 USgpm) with valve at max. flow rate
Drain flow, CG*V valves, when manual adjuster and/or pilot valve (i.e. CG5V) are in operation: CG*V-6 CG*V-8	 1,1 L/min (0.3 USgpm) 1,8 L/min (0.47 USgpm)
Response time, CG5V valves Typical time from applying signal at solenoid, with valve vented, until relief main valve closes; with minimum pressurized volume	 170 ms
Hydraulic fluids and fluid temperatures	See three pages on
Temperature limits	See three pages on
Thermal stability (pressure/temperature change)	 0,2 bar/°C (1.6 psi/°F)
Spare parts/service information: CG*V valves	 Publication no. 40751

Electrical Data, CG5V Valves

Coil voltages	See model code 10	
Permissible voltage fluctuation:		
Maximum	See "Temperature Limits", two pages on	
Minimum	90% rated (see model code 10)	
Relative duty factor	Continuous; ED = 100%	
Types of protection:		
ISO 4400 coils with plug fitted correctly	IEC144 class IP65	
Conduit box	IEC144 class IP65	
Coil winding	Class H	
Lead wires (coils type "F**")	Class H	
Coil encapsulation	Class F	
Power consumption for coils listed in model code 10:	Initial ◆ VA (RMS)	Holding VA (RMS)
AC coils:		
Single frequency coils at 50 Hz	225	39
Dual frequency coils at 50 Hz	265	49
Dual frequency coils at 60 Hz	260	48
DC coils, at rated voltage and 20°C (68°F):		
Type G, 12V DC	30W	–
Type H, 24V DC	30W	–

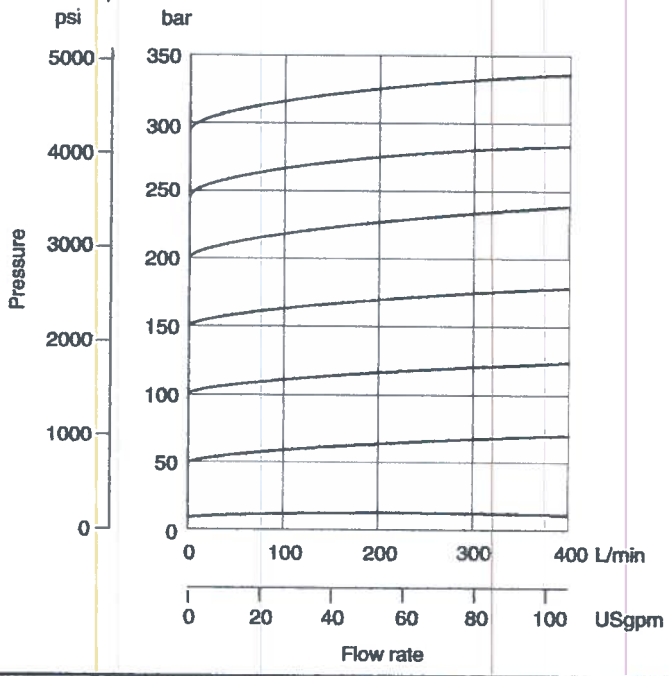
◆ *1st half cycle; solenoid armature fully retracted*

Performance Data

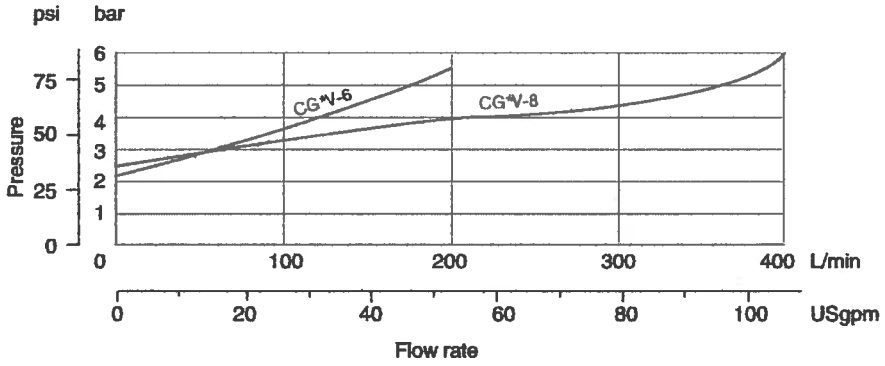
Typical with oil at 22 cSt (106 SUS) and at 50°C (122°F)

Pressure Override When Relieving

CG2V-8 examples



Pressure Override When Venting

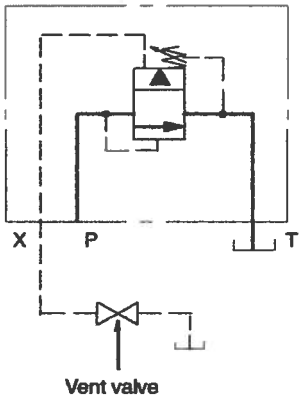


Control Data for CG2V Valves

Manual adjustment of pressure setting described in "Installation Dimensions".

Venting

System pressure can be dropped to near-zero by connecting vent port X to reservoir through a suitable pilot valve, e.g:



Hydraulic Remote Control

Remote adjustment of pressure setting can be made by a pilot relief valve, substituted for the vent valve in the diagram. Suitable pilot relief valves are described in catalogs 411 (type C-175 valves) and 409 (type CGR-02 valves).

Control Data for CG5V Valves

Vent Function

The solenoid operated pilot valve is Vickers model type DG4V-3S, with spool type "0B" (ref. catalog 2015). When the solenoid is de-energized, the CG5V relief valve is unloaded by venting the pilot drain to port T. Note that any back pressure at port T is additive to the minimum possible unloaded pressure, and is also additive to the on-load pressure setting.

When the solenoid is energized the pilot flow is blocked to bring the relief valve on load. For this function port X would normally be blocked (e.g. no connection from the mounting face). Further remote control pressure settings are possible by connecting port X to suitable pilot relief valves via other DG4V-3S type directional control valves.

Hydraulic Fluids

All valves can be used with:
Antiwear hydraulic oils (class L-HM)
Invert emulsions (class L-HFB)
Water glycol (class L-HFC)
Phosphate ester (class L-HFD), adding "F3-" prefix at model code [1].

The extreme viscosity range is from 500 to 13 cSt (2270 to 70 SUS) but the recommended range is 54 to 13 cSt (245 to 70 SUS).

For further information about fluids see "Technical Information" leaflet 920.

Temperature Limits

Minimum ambient: –20°C (–4°F)
Maximum ambient:
For CG2V valves: 70°C (158°F)

For CG5V valves with coils listed in model code [10] and at 110% of rated voltage:

Coil type and frequency	Max. ambient temperature
Dual frequency coils	
at 50 Hz	65°C (149°F)
at 60 Hz	65°C (149°F)
Single frequency (50 Hz) coils	
at 50 Hz	65°C (149°F)
DC coils	70°C (158°F)

Fluid temperatures (all models)

	Petroleum oil	Water-containing
Min.	–20°C (–4°F)	+10°C (+50°F)
Max.*	+70°C (+158°F)	+54°C (+129°F)

* *To obtain optimum service life from both fluid and hydraulic system, 65° C (150° F) normally is the maximum temperature except for water-containing fluids.*

For synthetic fluids consult fluid manufacturer or Vickers representative where limits are outside those of petroleum oil.

Whatever the actual temperature range, ensure that viscosities stay within the limits specified in the "Hydraulic Fluids" section.

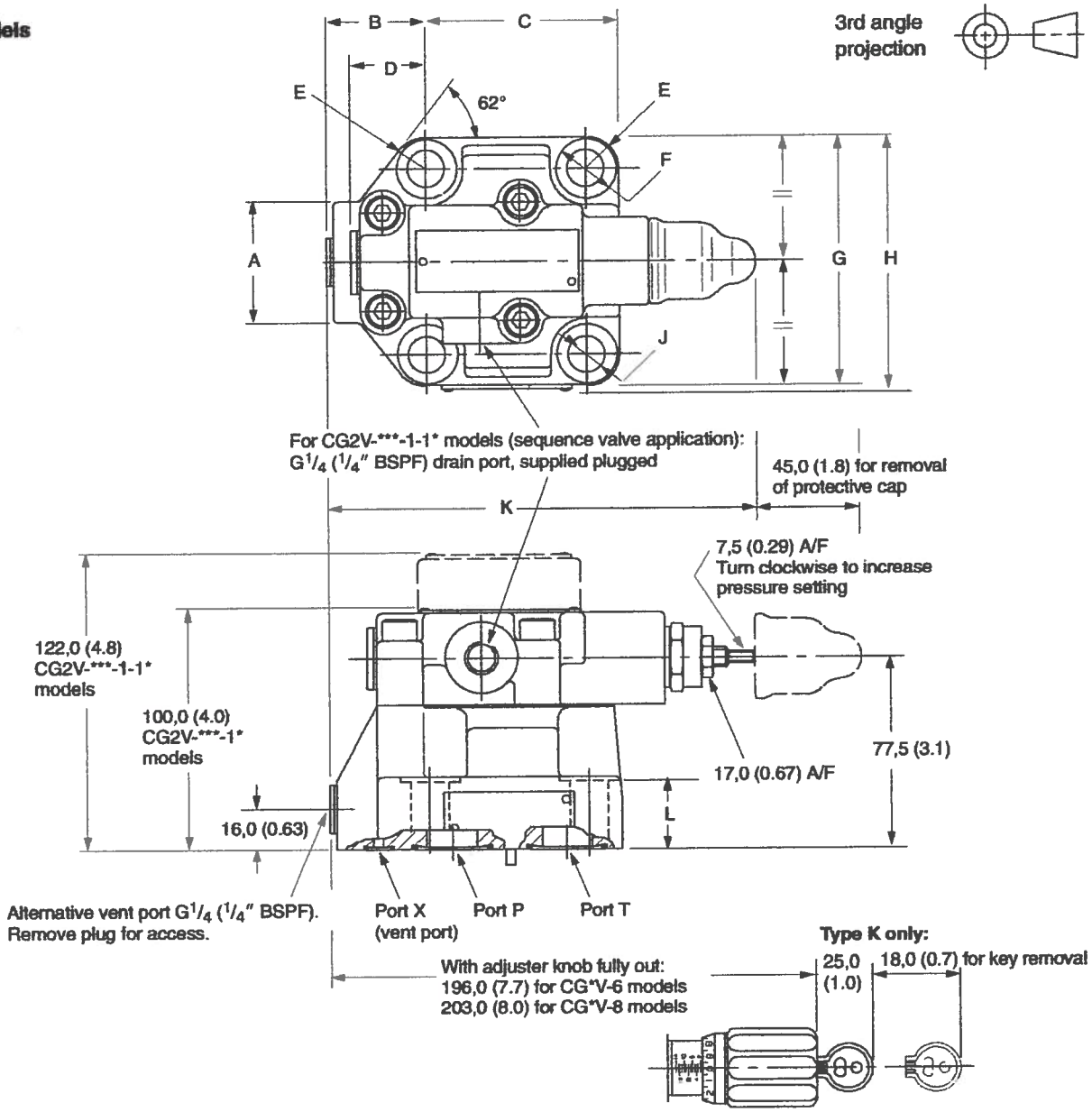
Contamination Control Requirements

Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 9132 or 561, "Vickers Guide to Systemic Contamination Control". The book also includes information on the Vickers concept of "ProActive Maintenance". The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm. For products in this catalog the recommended levels are:

Up to 210 bar (3050 psi) 19/17/14
Above 210 bar (3050 psi) 19/17/14

Installation Dimensions in mm (inches)

CG2V Models



3rd angle projection

Model	A	B	C	D	E rad.	Ø F (dia)	G
CG*V-6	58,0 (2.3)	35,0 (1.4)	68,0 (2.7)	35,0 (1.4)	12,0 (0.5)	20,0 (0.78)	79,0 (3.1)
CG*V-8	42,0 (1.7)	39,0 (1.54)	83,0 (3.3)	30,0 (1.2)	16,0 (0.63)	26,0 (1.02)	103,0 (4.1)

Model	H	Ø J (dia)	K	L	M (AC coils)	M (DC coils)
CG*V-6	82,0 (3.23)	13,5 (0.53)	176,0 (7.0)	20,0 (0.78)	160,0 (6.3)	170,0 (6.7)
CG*V-8	106,0 (4.2)	17,0 (0.7)	183,0 (7.2)	25,0 (1.0)	169,0 (6.65)	179,0 (7.1)

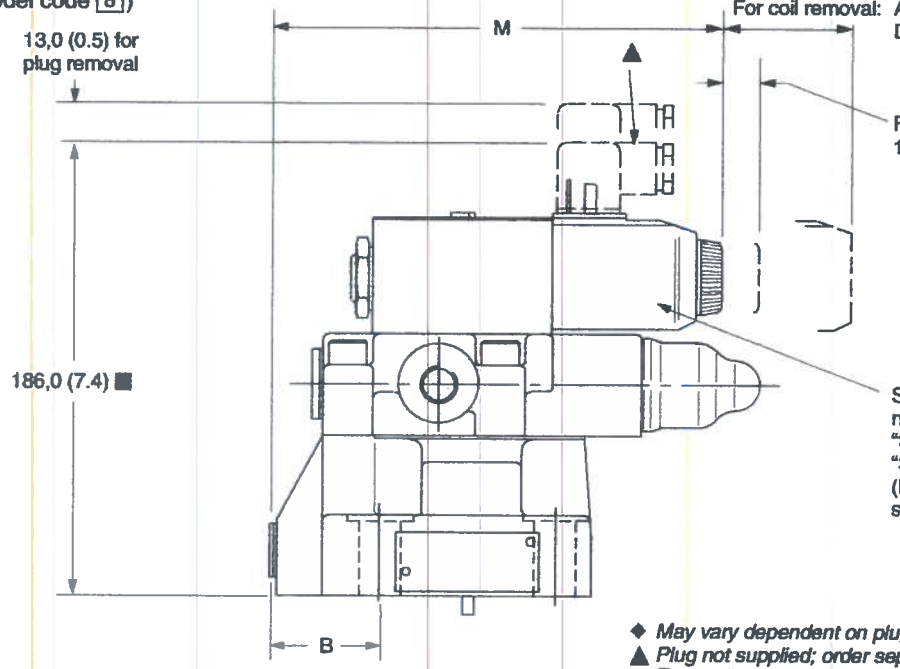
Micrometer Adjustment Options: "K" or "M" in Model Code [4]

"K" Feature

To adjust pressure setting, insert key and turn clockwise. Turn micrometer knob clockwise to increase pressure setting; counter-clockwise to decrease setting. When the key is removed the knob can spin freely without affecting the pressure setting.

CG5V Models

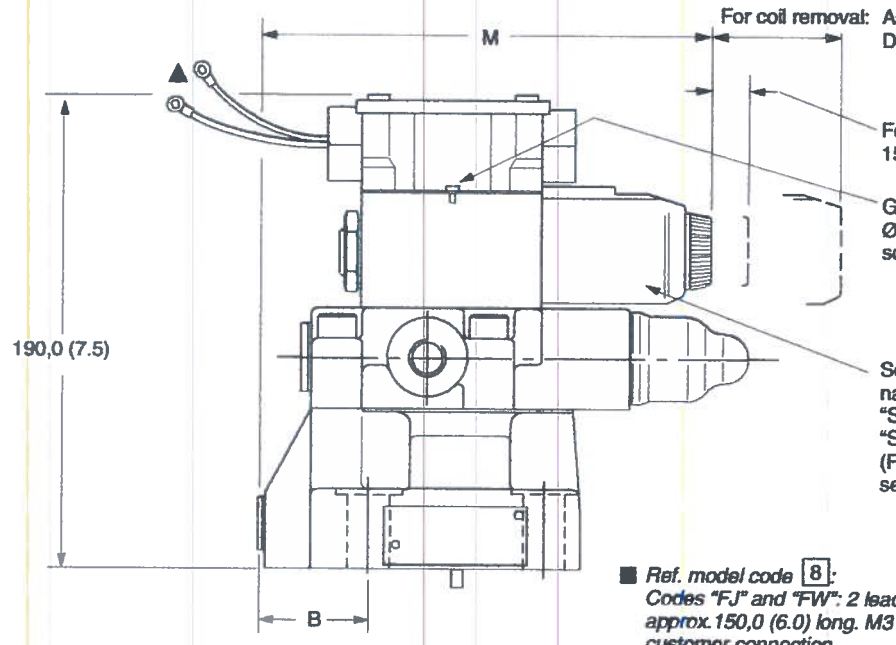
With Type "U" Coil Connection
("U" at model code [8])


M
13,0 (0.5) for plug removal
186,0 (7.4) ■
B
For coil removal: AC solenoid: 45,0 (1.8) DC solenoid: 61,0 (2.4)
For manual override type "H": 15,0 (0.6)
Solenoid identity (printed on nameplate of pilot valve) is: "Sol. A" to German practice "Sol B" to ANSI/NFPA standard (For solenoid identity methods see "Model Code" [7])

◆ *May vary dependent on plug source.*
▲ *Plug not supplied; order separately if required. For available plug types see section "Electrical Plugs and Connectors".*

For dimensions "B" and "M", see previous page.

With Type "F" Coil Connection
("F(T)J" or "F(T)W" at model code [8])

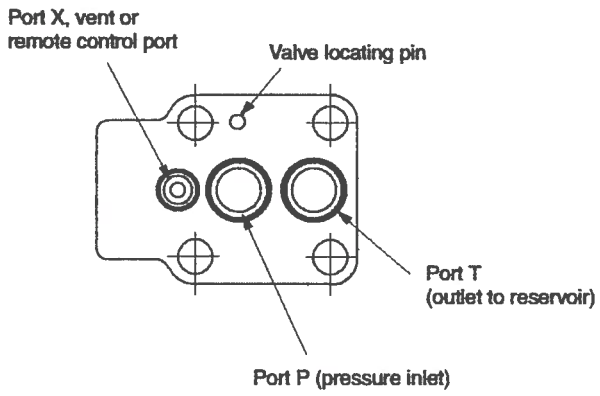

M
190,0 (7.5)
B
For coil removal: AC solenoid: 45,0 (1.8) DC solenoid: 61,0 (2.4)
For manual override type "H": 15,0 (0.6)
Ground (earth) connection: Ø4,0 (0.16 dia) self-tapping screw
Solenoid identity (printed on nameplate of pilot valve) is: "Sol. A" to German practice "Sol B" to ANSI/NFPA standard (For solenoid identity methods see "Model Code" [7])

■ *Ref. model code [8]:*
Codes "FJ" and "FW": 2 lead wires for each solenoid, approx.150,0 (6.0) long. M3 terminals provided for customer connection.
Codes "FTJ" and "FTW": lead wires connected into terminal strip suitable for M3 terminals on customer connection.

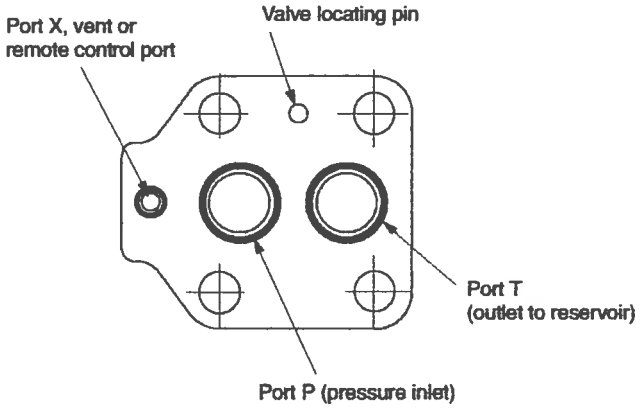
For dimensions "B" and "M", see previous page.

Views on Bottom Faces of Valves
See also "Mounting Surfaces".
All O-seals supplied.

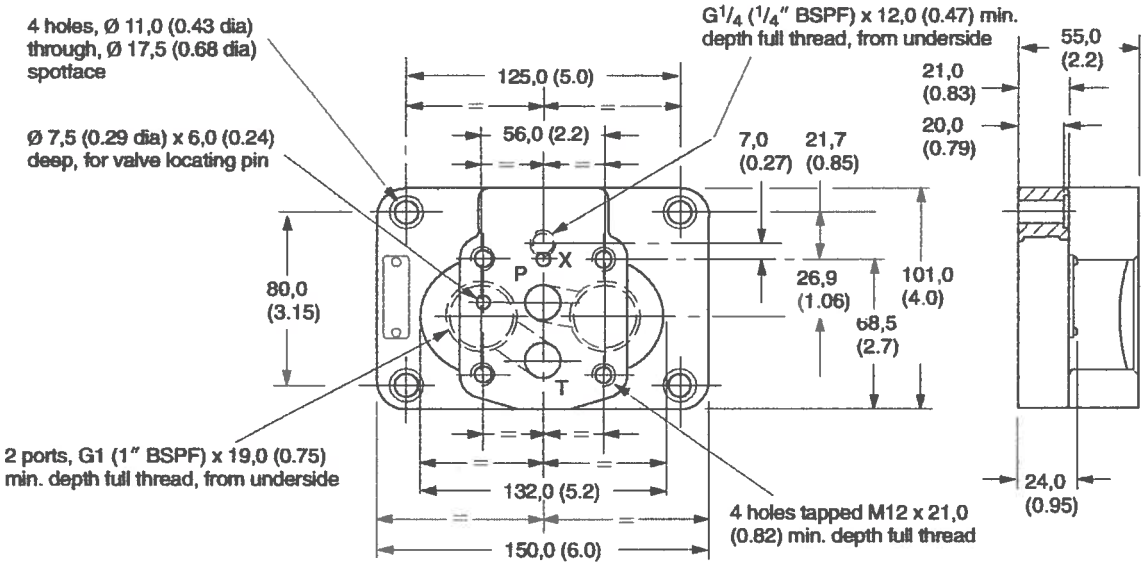
CG*V-6



CG*V-8



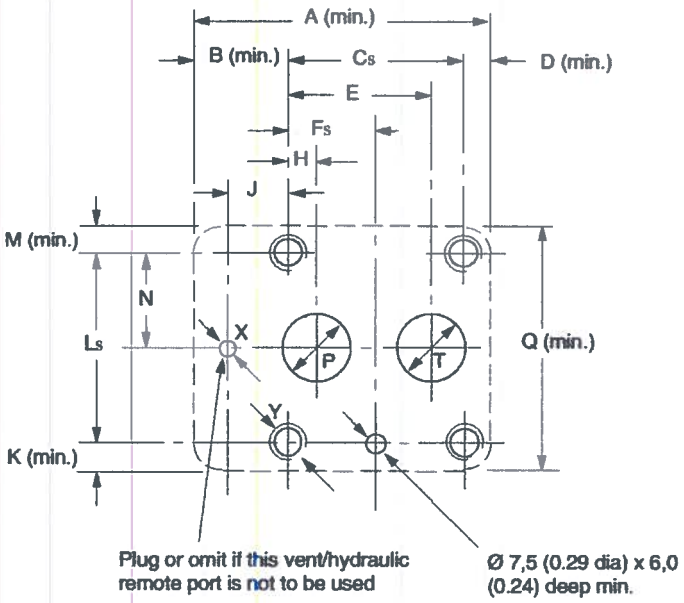
CGVM-6-10-R Subplate



Mounting Surfaces, ISO 6264
AR-06-2-A
AS-08-2-A

When a subplate is not used a raised pad must be provided for mounting. The pad must be flat within 0,001 mm/100 mm (0.0001″/10″) and smooth within 0,8 µm (32 µin). Dimensional tolerances are ±0,2 mm (0.008″) except where indicated.

Port functions
P = Pressure inlet
T = Outlet to reservoir
X = Vent, or remote pilot control port



Size	A	B	C	D	E	F	H	J	K	L
AR-06	80 (3.2)	13,1 (0.5)	53,8 (2.12)	13,1 (0.5)	47,5◆ (1.87)	22,1 (0.87)	22,1◆ (0.87)	0 (0)	13,1 (0.5)	53,8 (2.12)
AS-08	118 (4.7)	35,0 (1.4)	66,7 (2.63)	16,3 (0.7)	55,6 (2.19)	33,4 (1.35)	11,1 (0.44)	23,8 (0.94)	16,0 (0.63)	70,0 (2.76)

Size	M	N	Ø P (dia)	Q	Ø T (dia)	Ø X (dia)	Y thread x min. full thread depth
AR-06	13,1 (0.5)	26,9 (1.06)	14,7 (0.58)	80 (3.2)	14,7 (0.58)	4,8 (0.19)	M12 x 21 ($^{7}/_{16}$″ UNF x 0.83) ▼
AS-08	16,0 (0.63)	35,0 (1.38)	23,4 (0.92)	102 (4.0)	23,4 (0.92)	6,3 (0.25)	M16 x 30 ($^{5}/_{8}$″ UNF x 1.2) ▼

▲ *Tolerance on bolt and pin locations ± 0,1 (0.004).*
◆ *These ISO standard dimensions can be used, but improved flow paths to and from valve are obtained by using 48,0 (1.89) instead of 47,5 (1.87), and 22,6 (0.89) instead of 22,1 (0.87).*
▼ *ISO standard does not give UNC bolt sizes. These are recommended equivalents to metric sizes specified in the standard.*

Installation Data

Mounting Attitude
Unrestricted.

Subplates
For CG*V-6 valves see type CGVM-6-10-R on previous page.
For CG*V-8 valves consult your Vickers representative.

Mounting Bolts/Torques
For CG*V-6 valves: bolt kit BKCG2V-6. Bolts should be torqued to 103-127 Nm (76-94 lbf ft), with threads lubricated.

For CG*V-8 valves: bolt kit BKCG2V-8. Bolts should be torqued to 257-315 Nm (190-232 lbf ft), with threads lubricated.

Mass (approx.)

CG2V-6 ..... 3,5 kg (7.7 lb)
CG2V-8 ..... 4,4 kg (9.7 lb)
CG5V-6:
With AC solenoid ..... 5,0 kg (11 lb)
With DC solenoid ..... 5,2 kg (11.5 lb)
CG5V-8:
AC solenoid ..... 5,9 kg (13 lb)
DC solenoid ..... 6,1 kg (13.5 lb)

Electrical Plugs and Connectors

Plugs for ISO 4400 (DIN 43650) Type Coil Connection
For CG5V valves with type "U" coils (model code [8])

The cable entry on these plugs can be repositioned at 90° intervals by reassembly of the contact holder relative to the plug housing. The cable entry is Pg11 for cable Ø 6-10 mm (0.24-0.4").

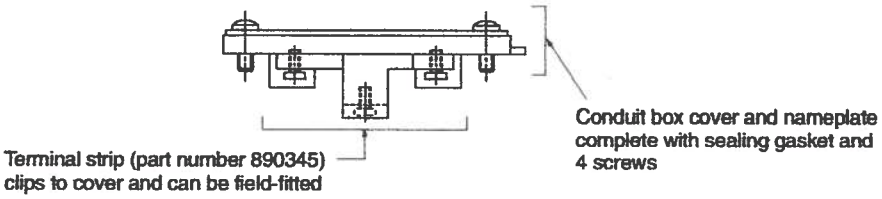
Order plugs separately by part number.

Voltage	Part number Gray (Sol.A)	Black (Sol.B)
Without indicator light		
–	710776	710775
With indicator light		
12- 24V	977467	977466
100-125V	977469	977468
200-240V	977471	977470

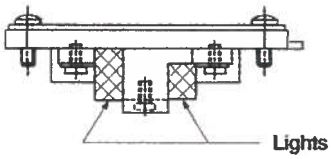
Terminal Strip and Lights

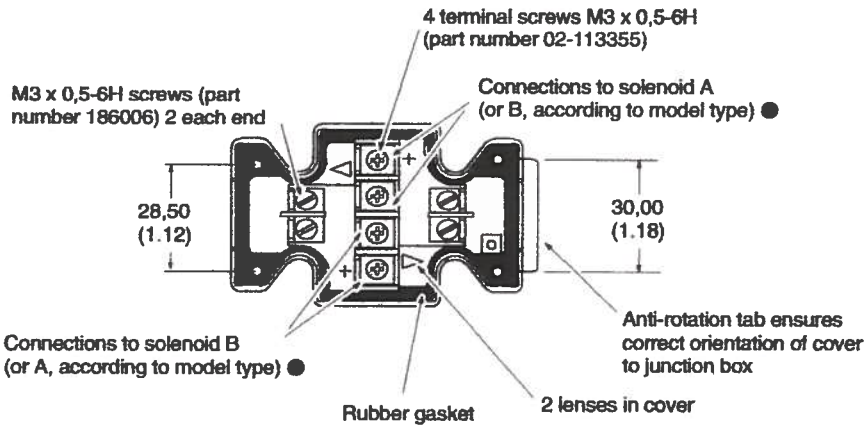
For CG5V valves with type F(T)J or F(T)W coils, see model code [8]

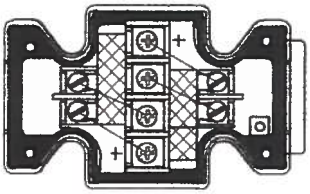
For "FTJ" or "FTW" at model code [8]


Terminal strip (part number 890345) clips to cover and can be field-fitted
Conduit box cover and nameplate complete with sealing gasket and 4 screws

For "FTJL" or "FTWL" at model code [8] + [9]




4 terminal screws M3 x 0,5-6H (part number 02-113355)
M3 x 0,5-6H screws (part number 186006) 2 each end
Connections to solenoid A (or B, according to model type) ●
28,50 (1.12)
30,00 (1.18)
Anti-rotation tab ensures correct orientation of cover to junction box
Connections to solenoid B (or A, according to model type) ●
Rubber gasket
2 lenses in cover



● *1. For DC coils the +ve lead(s) must be connected to the terminal(s) marked +. When using 3-wire incoming leads to double solenoid valves (i.e. common neutral) the inner pair of terminals must be linked.*

2. For correct light indication of energized solenoid ensure that solenoid leads are correctly connected: light terminals are common with each outer pair of solenoid terminals according to the side with + mark.

Ordering Procedure

Valves, subplates and bolt kits should be ordered by full model code designation. Order plugs by part number.

VICKERS®

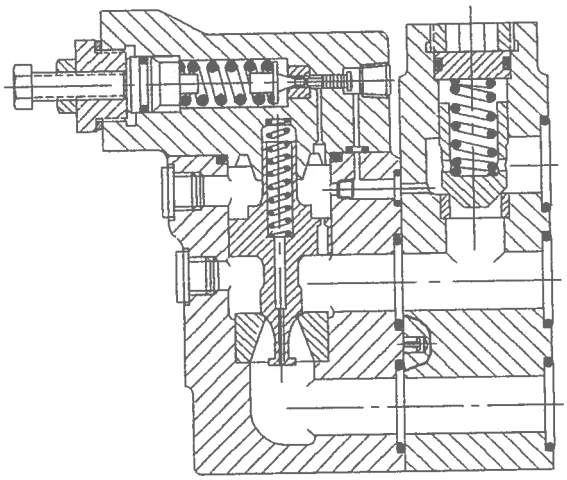
Pressure Relief Valves

Unloading Relief Valves

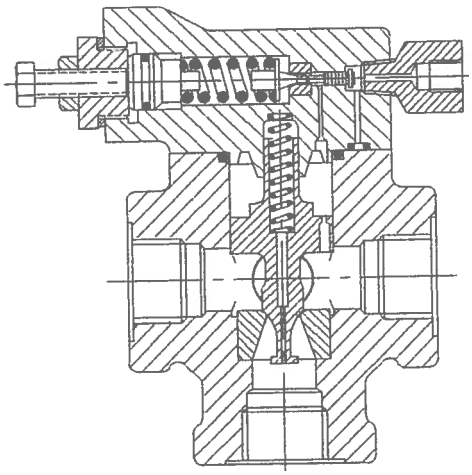
EURG1/2-06/10, 13 Design and EURT1/2-06/10, 12 Design

Sectional Illustrations

EURG*



EURT*



Basic Characteristics

Mounting ... Pipe or subplate mounting
Unloading pressure ..... Up to 210 bar (3000 psi)
Rated flow ..... Up to 246 L/min (65 USgpm)
Method of actuation ... Internally piloted

General Description

Unloading relief valves are primarily used in hydraulic circuits incorporating accumulators where a pressure regulator is required to automatically unload the pump when the pressure reaches the pre-adjusted pressure setting of the valve.

When the pressure has dropped to approximately 85% of the valve setting the valve spool closes, thus diverting the pump delivery to the accumulator.

On the EURG models an integral check valve prevents return flow from the accumulator through the unloading valve; for the EURT model to provide this function a separate right angle check valve, model C2-815 ($^3/_4$") or C2-825 ($1^1/_4$") must be provided.

These valves may also be used with a double pump to deliver a large volume of oil to the system at low pressure and a small volume at high pressure, serving the same function as a separate unloading valve and check valve.

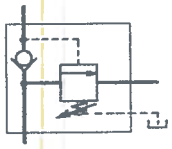
VICKERS

May 1996

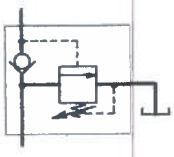
GB-404A

Functional Symbols

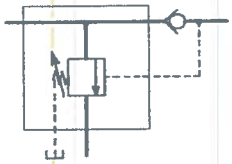
EURG1



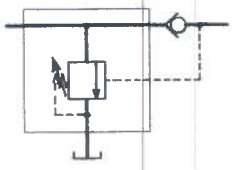
EURG2



EURT1

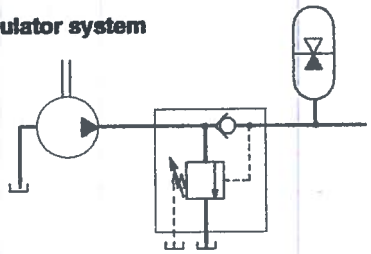


EURT2

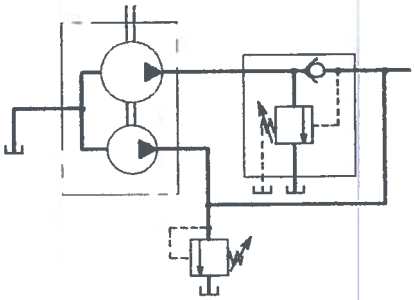


Applications

1. Single pump/accumulator system



2. Double pump system



Note that the EURG1 model shown in both systems can be replaced by the EURG2 or an EURT* plus the external check valve

Model Codes

Valves

**(F3) - EUR * * - ** - * (V) - ** **

1 2 3 4 5 6 7 8

1 Seals for phosphate ester fluids
(See also the "Hydraulic Fluids" section)
Omit if not required

2 Mounting method
G = Subplate mounted
T = Pipeline mounted

3 Drain
1 = External drain
2 = Internal drain

4 Nominal port size
06 = 3/4"
10 = 1 1/4"

5 Pressure adjustment range
B = 25 - 69 bar (350 - 1000 psi)
C = 35 - 138 bar (500 - 2000 psi)
F = 104 - 210 bar (1500 - 3000 psi)

6 High venting spring
EURG models only
Omit if not required

7 Design number
12 = EURT model
13 = EURG model
Design numbers are subject to change. Installation dimensions remain the same for design numbers 10 to 19 inclusive.

8 Port tappings/fixing bolts
UB= G (BSPF) port tappings (EURT models)
UG= Accept metric or inch fixing bolts (EURG models)

Subplate

EURG1M - ** - 20 - R

1 2

1 Nominal port size
06= 3/4"
10= 1 1/4"

2 Design number, 20 series
Subject to change. Installation dimensions remain the same for design numbers 20 to 29 inclusive.

Metric Fixing Bolt Kits
(EURG valves)
BKUR-06-682M for EURG-06 valves
E-BKUR-10-683M (Assy. no. 460852) for EURG-10 valves

Operating Data

Max. Pressures

Pressure inlet and system ports .. Up to 210 bar (3000 psi) dependent on model

Tank ports

EUR*1 models ..... Up to 85% of inlet pressure

EUR*2 models ..... Up to 5% of inlet pressure

Pilot pressure port

EURT* models ..... Up to 210 bar (3000 psi) dependent on model

Drain port

EUR*1 models ..... Drain must be connected to tank through a surge free line so there will be no back pressure at this port.

Failure to connect the drain can result in infinite system pressures and machine damage.

EURT2 models are internally drained and this port is not used.

Pressure Adjustment Range

See "Model Code".

Flow Data

Rated flow, L/min (USgpm)

EURT*-06 ..... 75 (284)

EURG*-06 ..... 95 (360)

EURT*-10 ..... 190 (720)

EURG*-10 ..... 246 (930)

Hydraulic Fluids

All valves can be used with antiwear hydraulic oils, water-in-oil emulsions and water-glycols. Add prefix "F3" to model designation when phosphate ester (not alkyl-based) or chlorinated hydrocarbons are to be used.

The extreme operating viscosity range is from 860 to 13 cSt (4000 to 70 SUS), but the recommended running range is 54 to 13 cSt (245 to 70 SUS).

For further information about fluids see leaflet 694.

Temperature Limits

Ambient

Min. ..... –20°C (–4°F)

Max. ..... +70°C (+158°F)

Fluid Temperature

	Petroleum oil	Water-containing
Min.	–20°C (–4°F)	+10°C (50°F)
Max.*	+80°C (176°F)	+54°C (130°F)

* *To obtain optimum service life from both fluid and hydraulic system 65° C (150° F) normally is the maximum temperature except for water-containing fluids.*

For synthetic fluids consult manufacturer or Vickers representative where limits are outside those for petroleum use.

Whatever the actual temperature range, ensure that viscosities stay within the limits specified in the "Hydraulic Fluids" section.

Contamination Control Requirements

Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 9132 or 561, "Vickers Guide to Systemic Contamination Control". The book also includes information on the Vickers concept of "ProActive Maintenance". The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm. For products in this catalog the recommended levels are:

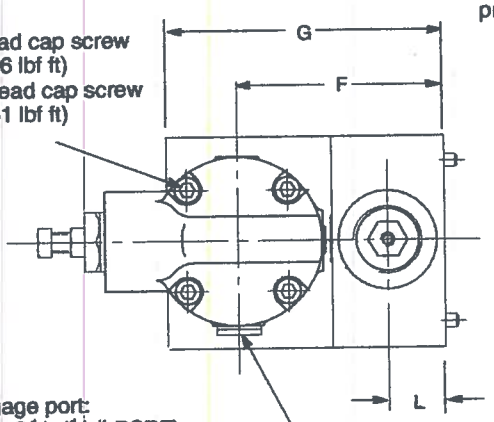
Up to 210 bar (3000 psi) **19/17/14**

Installation Dimensions **in mm (inches)**

EURG*-06/10

3rd angle projection

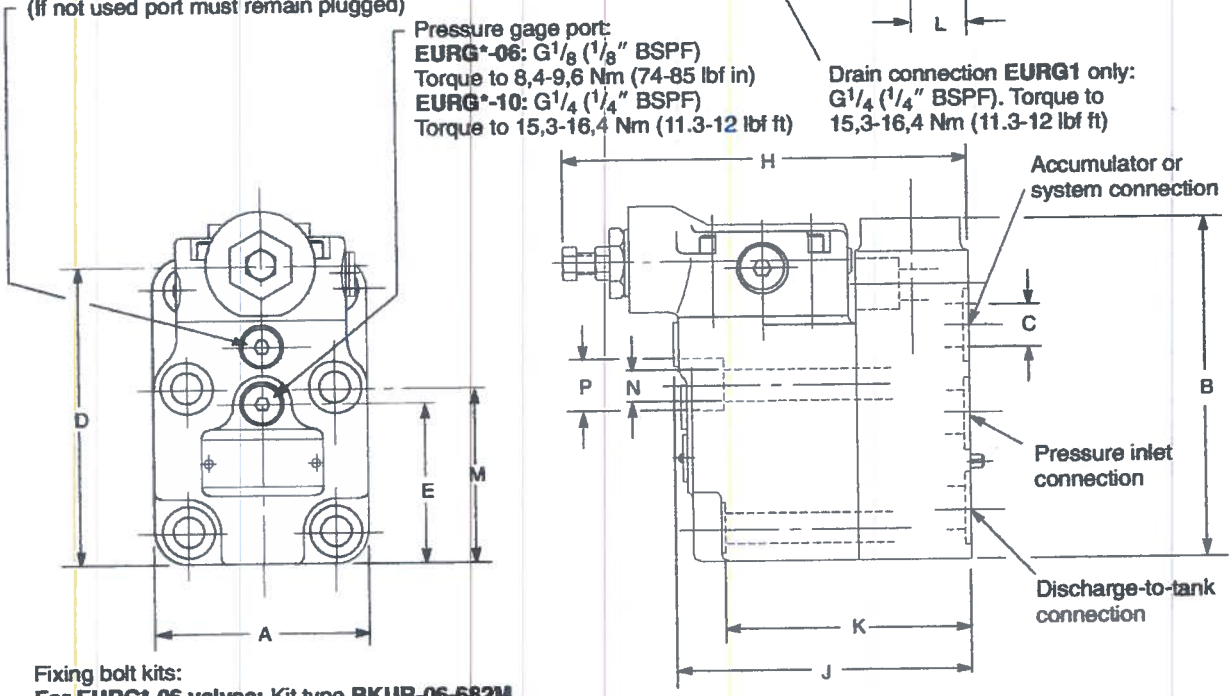
Cover fixing screws, 4 off:
EURG*-06: M8 socket head cap screw
Torque to 32-36 Nm (24-26 lbf ft)
EURG*-10: M10 socket head cap screw
Torque to 62-70 Nm (46-51 lbf ft)



Vent port:
EURG*-06: G1/8 (1/8" BSPF)
Torque to 6,8-7,5 Nm (60-66 lbf in)
EURG*-10: G1/4 (1/4" BSPF)
Torque to 15,3-16,4 Nm (11.3-12 lbf ft)
(If not used port must remain plugged)

Pressure gage port:
EURG*-06: G1/8 (1/8" BSPF)
Torque to 8,4-9,6 Nm (74-85 lbf in)
EURG*-10: G1/4 (1/4" BSPF)
Torque to 15,3-16,4 Nm (11.3-12 lbf ft)

Drain connection **EURG1** only:
G1/4 (1/4" BSPF). Torque to
15,3-16,4 Nm (11.3-12 lbf ft)



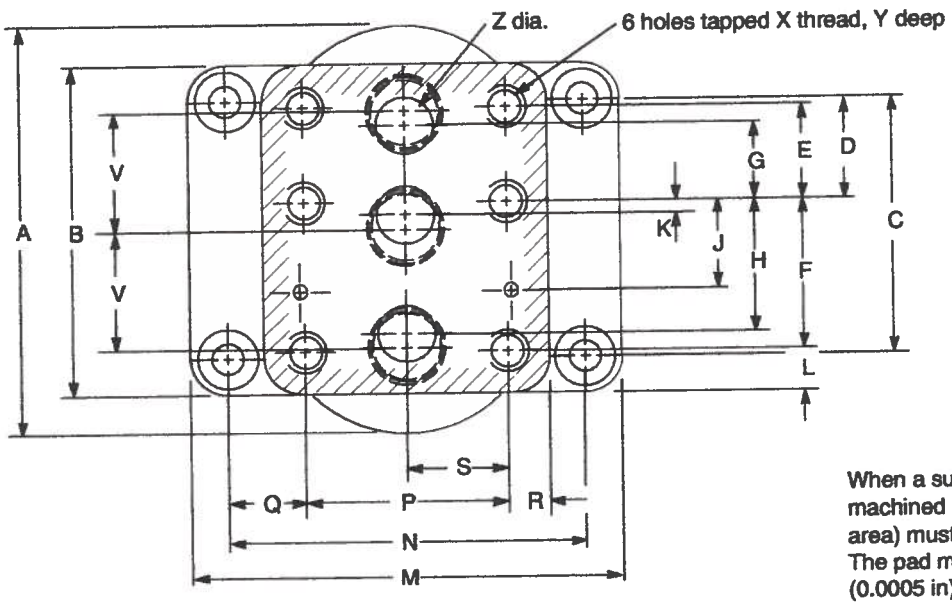
Fixing bolt kits:
For EURG*-06 valves: Kit type **BKUR-06-682M**
Torque to 257-317 Nm (190-233 lbf ft), lubricated
For EURG*-10 valves: Kit type **E-BKUR-10-683M**
Torque to 503-615 Nm (370-453 lbf ft), lubricated

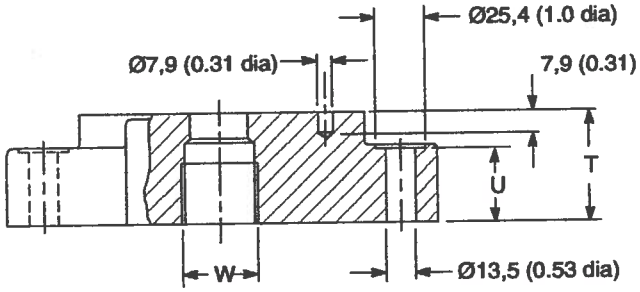
For mounting subplates see next page.

Model	A	B	C	D	E	F	G	H	J	K	L	M	N	P
EURG*-06	101,6 (4.0)	160,3 (6.31)	23 (0.91)	139,7 (5.5)	76,2 (3.0)	92,2 (3.63)	124,0 (4.88)	181,0 (7.13)	134,1 (5.28)	108,0 (4.25)	25,4 (1.0)	82,8 (3.26)	17 (0.67)	26 (1.02)
EURG*-10	120,7 (4.75)	217,5 (8.56)	28,6 (1.13)	179,3 (7.06)	95,3 (3.75)	117,6 (4.63)	157,2 (6.19)	206,3 (8.12)	167,6 (6.6)	138,1 (5.44)	33,3 (1.31)	108 (4.25)	21 (0.83)	32 (1.26)

Subplate for EURG*-06/10 Valves

3rd angle projection





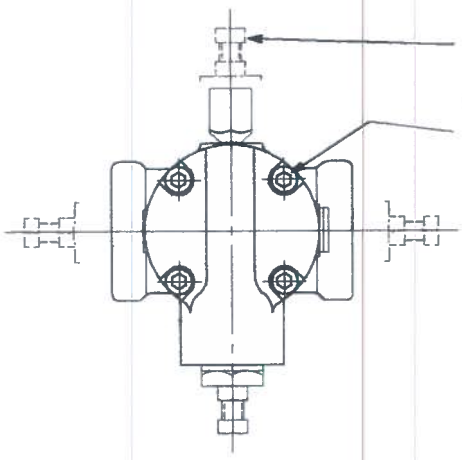
When a subplate is not used, a machined pad (as indicated by shaded area) must be provided for mounting. The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 μm (63 microinch). Mounting bolts provided by the customer should be Class 12,9 (ISO 898) or better.

Model	A	B	C	D	E	F	G	H	J	K	L	M
EURG1M-06	– –	145 (5.71)	113 (4.38)	46 (1.81)	46 (1.81)	66,7 (2.63)	33,3 (1.31)	55,6 (2.19)	33,3 (1.31)	11,1 (0.44)	15,9 (0.63)	162 (6.34)
EURG1M-10	200 (7.87)	178 (7.0)	146,1 (5.75)	54 (2.13)	50,8 (2.0)	88,9 (3.5)	38,1 (1.5)	76,2 (3.0)	44,5 (1.75)	12,7 (0.5)	19,1 (0.75)	184 (7.24)

Model	N	P	Q	R	S	T	U	V	W	X	Y	Z
EURG1M-06	130,2 (5.13)	69,9 (2.75)	30,2 (1.19)	15,9 (0.63)	34,9 (1.37)	39,9 (1.57)	23,9 (0.94)	48,3 (1.9)	$G^3/_4''$	M16	Thru' 40 (1.57)	23 (0.91)
EURG1M-10	152,4 (6.0)	82,6 (3.25)	34,9 (1.37)	19,1 (0.75)	41,3 (1.63)	50 (1.97)	30,2 (1.19)	64,3 (2.53)	$G1^1/_4''$	M20		28,6 (1.13)

EURT*-06/10

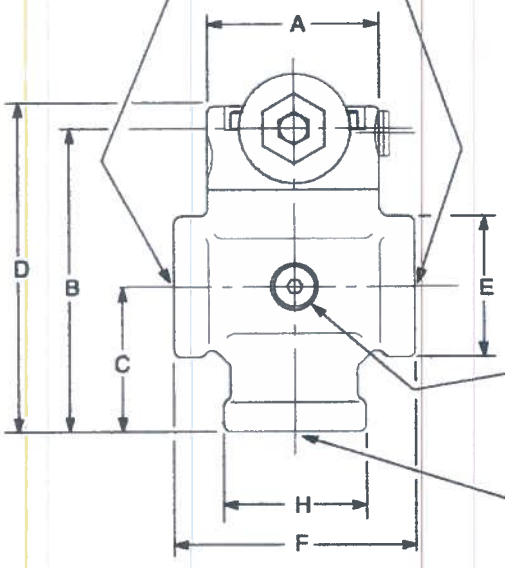
3rd angle projection



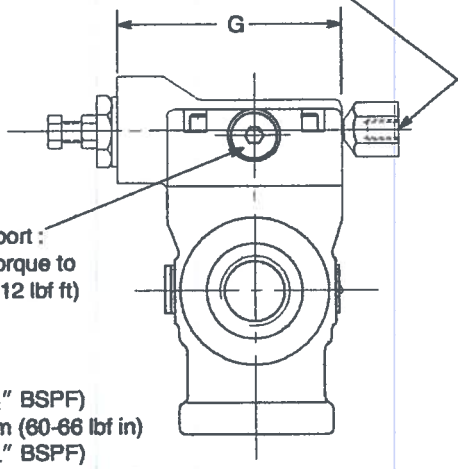
4 optional positions for adjustment control may be obtained by rotating cover to required position

Cover fixing screws, 4 off:
EURT*-06: M8 socket head cap screw
Torque to 32-36 Nm (24-26 lbf ft)
EURT*-10: M10 socket head cap screw
Torque to 62-70 Nm (46-51 lbf ft)

Pressure inlet or outlet connection:
EURT*-06: G3/4 (3/4" BSPF)
EURT*-10: G1 1/4 (1 1/4" BSPF)



Pilot pressure connection for unloading pump, G1/4 (1/4" BSPF)



EURT1 only: Drain port : G1/4 (1/4" BSPF). Torque to 15,3-16,4 Nm (11.3-12 lbf ft)

Pressure gage port:
EURT*-06: G1/8 (1/8" BSPF)
Torque to 6,8-7,5 Nm (60-66 lbf in)
EURT*-10: G1/4 (1/4" BSPF)
Torque to 15,3-16,4 Nm (11.3-12 lbf ft)

Discharge-to-tank connection:
EURT*-06: G3/4 (3/4" BSPF)
EURT*-10: G1 1/4 (1 1/4" BSPF)

Model	A	B	C	D	E	F	G	H
EURT*-06	77,7 (3.06)	133,4 (5.25)	65 (2.56)	159 (6.26)	57,2 (2.25)	108,0 (4.25)	127,8 (5.03)	63,5 (2.5)
EURT*-10	95,3 (3.76)	165,1 (6.5)	76,2 (3.0)	189 (7.44)	76,2 (3.0)	127,0 (5.0)	137 (5.39)	76, (3.0)

Mass, kg (lb)

EURG*-06 ..... 11,4 (25.0)
EURG*-10 ..... 22,1 (48.6)
EURT*-06 ..... 4,6 (10.1)
EURT*-10 ..... 9,1 (20.0)
EURG1M-06 ..... 5,7 (12.5)
EURG1M-10 ..... 9,3 (20.5)

Mounting Attitude

Optional.

Ordering Procedure

Before ordering check availability with the Vickers representative. Valves, subplates and bolt kits are supplied as separate items and must be ordered as such, e.g.
2 off -EURG1-06-B-13-UG valves
2 off -EURG1M-06-20-R subplates
2 off -BKUR-682M bolt kits

If a EURT valve is required then a check valve is also needed and must be ordered separately. The check valves recommended are C2-815 ($^3/_4$") or C2-825 ($1^1/_4$"). For further details of these valves refer to leaflet 2334.

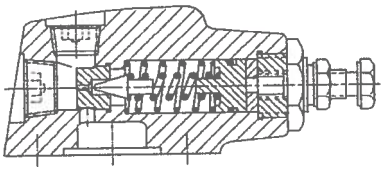
Vickers®

Pressure Relief

EATON

Remote Control Pressure Relief Valves
CGR-02, 21 Design

Typical Section



Basic Characteristics

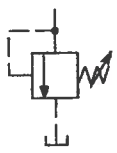
Operating pressures .... Up to 210 bar (3000 psi)
Flow rating ... 4,1 L/min (15.5 USgpm)
Mounting ..... Gasket

General Description

This valve is suitable as a remote control device for Vickers balanced piston type relief valves, e.g. models ECG-06/10). It is not intended to be used as a relief valve by itself.

The valve can provide adjustment of a system pressure from a convenient or remote location.

Functional Symbol



Model Code

F3 - CGR - 02 - * - (K) - 21

1 2 3 4 5 6

1 Special seals
See "Hydraulic Fluids" section

2 Pressure relief valve
For pilot and remote control

3 Nominal size
02 = $^1/_4$" nominal bore pipe size

4 Pressure adjustment range
B = 5-69 bar (75-1000 psi)
C = 5-138 bar (75-2000 psi)
F = 5-210 bar (75-3000 psi)

5 Handwheel adjustment
Omit for hex. head screw version

6 Design number
Subject to change.
Installation dimensions remain as shown for designs 20-29 inclusive.

Operating Data

Maximum Pressure
70, 140 or 210 bar (1000, 2000 or 3000 psi) according to adjustment range. See "Model Code" above.

Maximum Flow Rate
All models .... 4,1 L/min (15.5 USgpm)

Control Data
The pressure is adjusted by slackening the locknut and turning the adjusting device in a clockwise direction to increase pressure and counter-clockwise to decrease pressure. Re-tighten locknut after setting the pressure.

The outlet port should be piped directly to tank at atmospheric pressure. Any pressure at the drain port is additive to the pressure setting of the valve.

Hydraulic Fluids
All valves can be used with antiwear hydraulic oils, water-in-oil emulsions and water glycols.

Add prefix "F3" to model designation when phosphate ester (except alkyl-based) or chlorinated hydrocarbons are to be used.

Viscosities can range between 860 and 13 cSt (4000 and 70 SUS) but the recommended running range is from 54 to 13 cSt (245 to 70 SUS).

For further information about fluids see leaflet 694.

Temperature Limits
Ambient
Min. ..... –20°C (–4°F)
Max. ..... +70°C (158°F)

Fluid Temperature

	Petroleum oil	Water-containing
Min.	–20°C (–4°F)	+10°C (50°F)
Max.*	+80°C (+176°F)	+54°C (129°F)

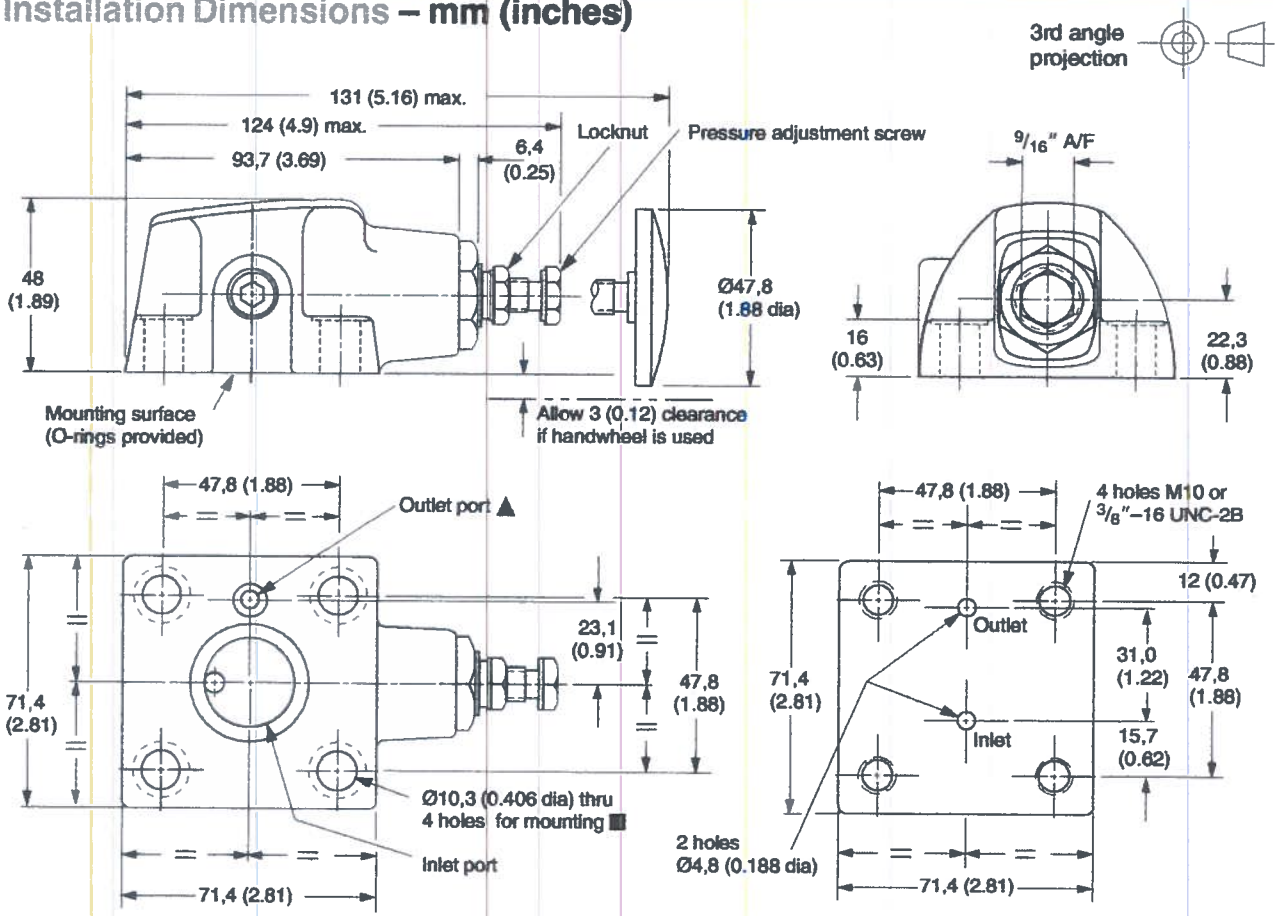
** To obtain optimum service life from both fluid and hydraulic system 65° C (150° F) normally is the maximum temperature except for water-containing fluids.*

For synthetic fluids consult manufacturer or Vickers representative where limits are outside those for petroleum use. Whatever the actual temperature range, ensure that viscosities stay within the limits specified in the "Hydraulic Fluids" section.

Contamination Control Requirements
Recommendations on contamination control methods and the selection of products to control fluid condition are included in Vickers publication 561, "Vickers Guide to Systemic Contamination Control". The book also includes information on the Vickers concept of "ProActive Maintenance".The following recommendations are based on ISO cleanliness levels at 2 µm, 5 µm and 15 µm. For products in this catalog the recommended levels are:

Up to 210 bar (3000 psi) **19/17/14**

Installation Dimensions – mm (inches)



▲ *Connect outlet port directly to tank. Any pressure at this port must be added to relief valve pressure setting.*

■ *Mounting bolt torque (M10 or 3/8" dia bolts) is 3,4 Nm (30 lb ft). Mounting bolts should be SAE grade 7 or better.*

Mounting Pad
The pad must be flat within 0,013 mm (0.0005 in) and smooth within 1,6 µm (63 microinch).

Mass

All models ..... 1,3 kg (2.9 lb)

Mounting Attitude

Optional.

Ordering Procedure

When ordering a unit please specify the complete model designation(s). See "Model Code".

Overhaul Manual

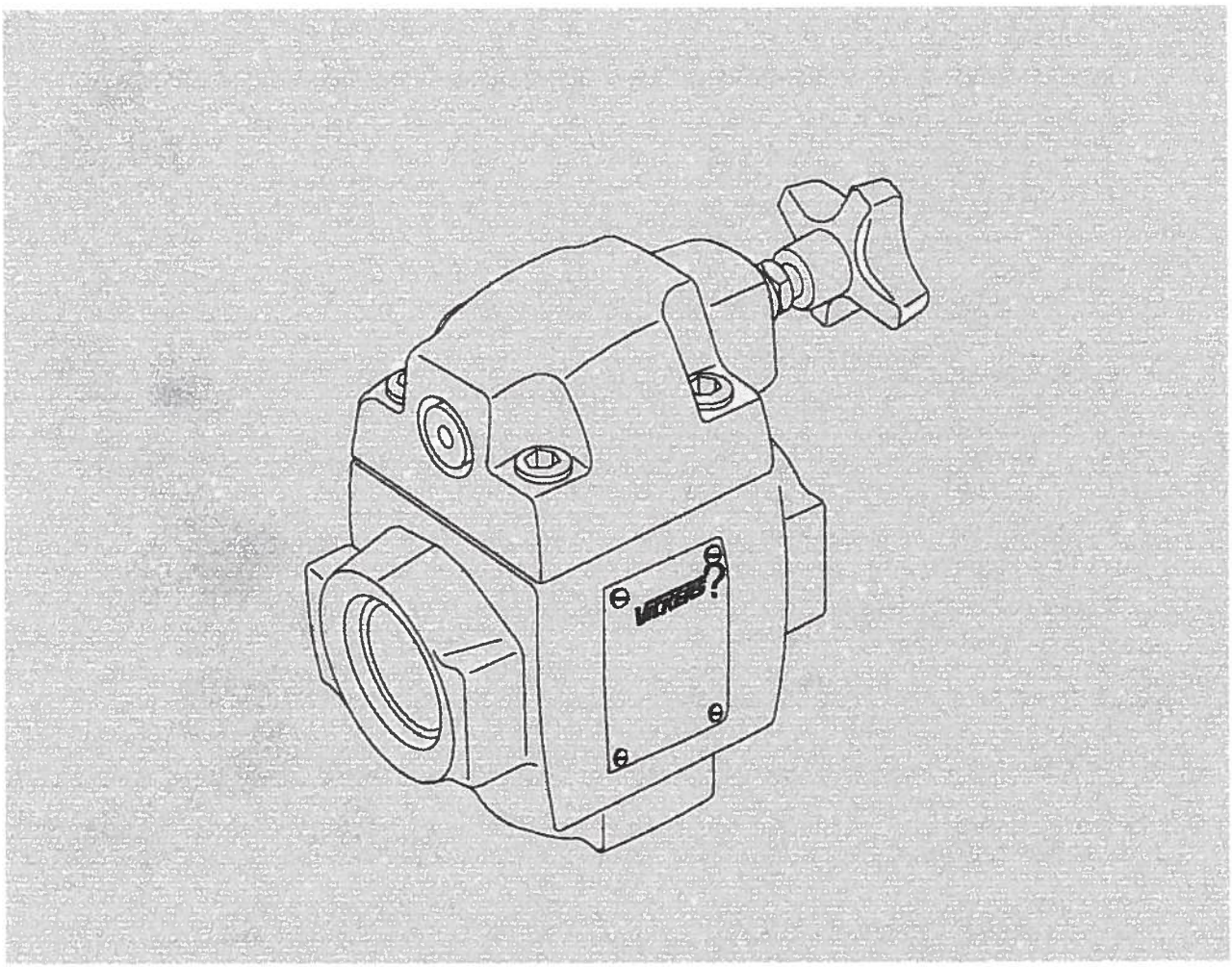
Vickers®

Relief Valves

EATON

Balanced Piston Relief Valves

CG/CS/CS5-03/06/10 Series
CT/CT5/CG5-06/10 Series



VICKERS

Revised 1/1/85

I-3300-S

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Section I – Introduction

A. Purpose Of Manual

This manual describes operational characteristics, maintenance requirements, and overhaul information for Vickers balance piston relief valves. The information contained herein pertains to the latest design series as listed in Table 1.

Model
CT/CS-10-**-30
CT/CS/CG-H10-**-30
CT/CS/CG-06-**-50
CT/CS/CG-H06-**-50
CS-03-**-50
CS5-03-***-***-90
CT5/CG5-*06/*10-***-***-90

Table 1

B. Related Publications

Service parts and installation dimensions are not contained in this manual. The parts and installation drawings listed in Table 2 is available from any Vickers application engineering office.

Model	Parts & Service Drawing	Installation Drawing
CG-06-**-20	I-3302-S	510900
CG-06-**-40	I-3306-S	
CG-06-**-50	I-3368-S	
CG-H06-*V-50	I-3366-S	
CG-H10-*V-30	I-3399-S	
CG-10-**-20	I-3301-S	
CG-10-**-30	I-3697-S	
CS-03-**-20	I-3301-S	510500
CS-03-**-40	I-3305-S	
CS-03-**-50	I-3369-S	
CS-06-**-20	I-3304-S	
CS-H06-*V-50	I-3367-S	
CS-H10-*V-30	I-3699-S	
CS-10-**-20	I-3304-S	
CS-10-**-30	I-3698-S	
CT-06-**-20	I-3301-S	
CT-06-**-40	I-3305-S	
CT-06-**-50	I-3369-S	
CT-H06-*V-50	I-3367-S	
CT-H10-*V-30	I-3699-S	
CT-10-**-20	I-3301-S	
CT-10-**-30	I-3698-S	
CS5-*03-***-***-70 *-***-70	I-3364-S	511005
CS5-*03-***-***-80 *-***-80	I-3679-S	
CS5-*03-***-***-81 *-***-81	I-3691-S	
CS5-*03-***-***-90 *-***-90		511006
CG5/CS5/CT5-*06-***-***-70	I-3364-S	511005
CG5/CS5/CT5-*06-***-***-80	I-3679-S	
CG5/CS5/CT5-*06-***-***-81	I-3691-S	
CG5/CS5/CT5-*10-***-***-70	I-3365-S	
CG5/CS5/CT5-*10-***-***-80/81	I-3680-S	
CG5/CS5/CT5-*10-***-***-90		511006

Table 2

C. Model Codes

Variations within each basic model series are covered in the model code. Table 3 is a complete breakdown of the model codes covering these units. Service inquiries should always include the complete unit model code as noted on the nameplate.

Model Code

(F3) C * (5) - (*) ** (*) (*) (P) - * (V) (Y) - **

1 2 3 4 5 6 7 8 9 10 11 12 13

1 Multi-fluid capability
(Viton Seals)

2 Relief valve

3 Port connection
G - Manifold or subplate mounted
S - SAE straight thread
T - NPTF Pipe Thread

4 Solenoid controlled
(Pilot stage models only)

5 H - High flow
(06/10 valve size only)

6 Valve size
03 - 3/8 inch
06 - 3/4 inch
10 - 1 1/4 inch

7 Spool function
(Pilot stage models only)

8 Pilot stage
(Solenoid controlled models only)
A - Spring offset
C - Spring centered

9 P - Manual override
('A' & 'B' pilot stage models only)

10 Pressure Range
B - 125-1000 PSI
C - 500-2000 PSI
F - 1500-3000 PSI

11 Vent Pressure
V - High vent
Omitted - Standard & low vent models

12 External drain feature
Y - Sequence Valve
Omitted - Standard Relief

13 Design

Table 3. Model Code Breakdown

Section II – Description

A. General

Relief valves are devices used to limit maximum pressure in hydraulic systems. When system pressure starts to exceed the pressure setting of the relief valve, a controlled amount of hydraulic fluid bypasses through the tank port and limits the system pressure to the valve setting. A fine incremented adjustment assures precise regulation over wide pressure ranges.

A Vickers relief valve provides a fast response with very low pressure override characteristics because of its two-stage balance piston design. The balance piston relief valve is so named because in normal operation it is in hydraulic balance. Further details are discussed in Section III.

B. Basic Parts

Relief valves consist of two sections: the cover section and the body section. The cover section includes a pressure adjustment screw, a heavy spring, a poppet, a seat, and a vent connection. The body section includes a piston, a light spring, a seat, and the port connections.

Section III – Principles of Operation

A. Pressure Relief

Figure 1 illustrates the basic valve operation. The valve pressure setting is determined by the adjusting screw position which varies the heavy spring compression. The balanced piston is normally held against the seat by the light spring. System pressure is present in chamber A and is connected to chamber B through orifice C.

The closed position of the valve is shown in Figure 1A. With system pressure less than the valve setting, the pilot poppet is held against its seat by spring force. Pressures in chambers A and B equalize through orifice C. Thus, the piston is hydraulically in balance and held against its seat by the light spring.

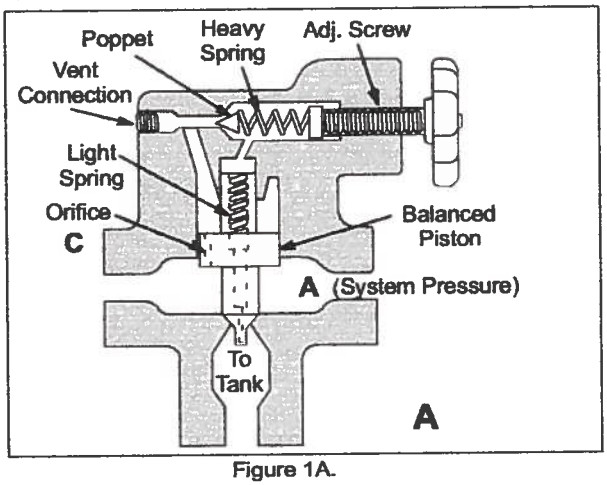


Figure 1A.

In Figure 1B the valve is shown throttling fluid to the tank port. This occurs when system pressure exceeds the heavy spring setting and forces the poppet away from its seat.

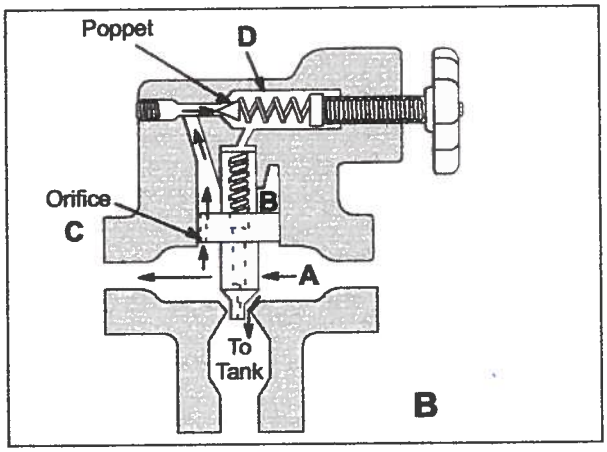


Figure 1B.

Fluid then flows through orifice C and chamber B, past the poppet into chamber D, and down through the drain hole in the center of the piston to the tank port.

The pressure in chamber B is limited by the setting of the heavy spring. When pressure in chamber A exceeds chamber B sufficiently, pressure unbalance overcomes the force of the light spring and lifts the piston. Excess fluid then flows past the bottom of the piston to tank.

When the system pressure drops below the valve setting,the poppet reseats. Control flow through orifice C stops and pressures in chambers A and B are again effectively equalized.

The light spring then forces the piston toward the seat while orifice C continues to equalize pressure between chambers A and B. When the balance piston is closed against its seat, all flow through orifice C stops.

B. Venting

The "High-Vent" option ("V" in the model code) is used when it is necessary to maintain pilot pressure for other valves in the system. This option provides a faster valve de-venting (closing) action. Higher pressure (approximately 80 PSIG) is maintained when the valve is vented because a heavier piston spring is used.

Relief valves can be vented to unload pump delivery to tank in the following manner:

Connect a shut-off valve to the vent port of the main relief valve. Chamber 'B' above the balanced piston can be opened to tank (see Figure 1B). This removes pressure at the top of the balanced piston. Pressure in chamber 'A' overcomes the light spring, unseats the balanced piston, and diverts all pump delivery to tank.

A solenoid controlled directional valve (C*5) may be used to vent flow to tank. This directional valve is mounted on top of a standard relief valve to form a single package. See Figure 6.

C. Remote Control

The main relief valve may be adjusted from a remote location by using another adjustable valve similar in function to the main relief valve pilot stage (see Figure 2.) Flow past the poppet of the remote control valve is directed to tank. The following rules should be maintained for optimum results:

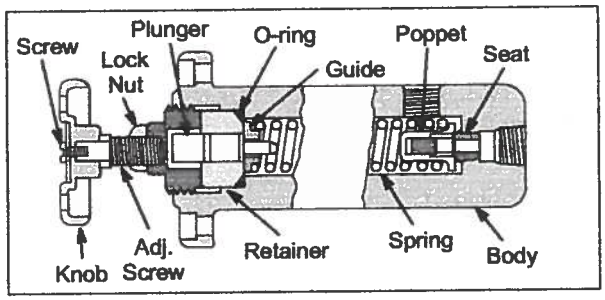


Figure 2.

1. Keep hydraulic lines (tubing) as short as possible.

2. Set main relief valve 200-300 PSIG above maximum operating pressure. DO NOT exceed the valve pressure rating.

3. Set remote control valve to maximum operating pressure.

4. Check system for stability characteristics. If the system is unstable, reduce the line length and/or proceed to step 5.

5. Install an orifice in the vent opening of the main relief valve cover and in the pressure port of the remote control valve. DO NOT go below 0.040 inch diameter or a malfunction could result. Orifices should be as large as possible to prevent excessive pressure drop and still maintain noise free operation.

Section IV – Installation

A. Installation Drawings

The installation drawings listed in Table 2 will show installation dimensions, port locations and operating parameters. Manifold, subplate and bolt kit information is also included.

NOTE

The tank line must be piped directly to tank to minimize back pressure. The drain line from the remotely operated valve (vent valve) must also be directly piped to tank. Any pressure in the drain line is additive to the pressure setting of the valve.

B. Circuit Connection

Threaded type CT/CS valves are usually connected directly in the pressure line. Circuit flow passes through the ports located on opposite sides of the valve body. The bottom port (opposite the cover) is the return flow port and is connected to tank. These valves may be teed into the pressure line by plugging or blocking one of the pressure outlet ports.

CG type gasket mounted valves are teed into pressure lines. The tee is connected to the pressure port of the valve sub-plate or manifold. The return port is connected to tank. The valve must be mounted against a flat, ported mounting surface.

Repair or replacement of CG valves is simplified in that piping need not be disturbed.

C. Piping And Tubing

1. All pipes and tubing must be thoroughly cleaned before installation. Recommended methods of cleaning are sandblasting, wire brushing and pickling.

NOTE

For instructions on pickling, refer to instruction sheet 1221 – S.

2. To minimize flow resistance and the possibility of leakage, only as many fittings and connections as are necessary for proper installation should be used.

3. The number of bends in tubing should be kept to a minimum to prevent excessive turbulence and friction of fluid flow. Tubing must not be bent too sharply. The recommended radius for bends is three times the inside diameter of the tube.

D. Fluids and Seals

Standard seals (Nitrile) can be used with petroleum, water glycols, and water-oil emulsion type fluids.

F3 seals (Viton*) can be used with all commonly used industrial hydraulic fluids. Viton is compatible with petroleum, water base and synthetic fire-resistant fluids.

*Trademark of Dupont De Nemours Co., Inc.

Section V – Service and Maintenance

A. Inspection

Periodic inspection of the fluid condition and tube or piping connections can save time-consuming breakdowns and unnecessary parts replacement. The following should be checked regularly.

1. All hydraulic connections must be kept tight. A loose connection in a pressure line will permit the fluid to leak out. If the fluid level becomes so low as to uncover the inlet pipe opening in the reservoir, extensive damage to system components can result. In suction or return lines, loose connections permit air to be drawn into the system resulting in noisy and/or erratic operation.

2. Air bubbles in the reservoir can ruin system components. If bubbles are seen, locate the source of the air and seal the leak.

B. Cleanliness

Clean fluid is the best insurance for long service life. Therefore, check the reservoir periodically for dirt and other contaminants. If the fluid becomes contaminated, flush the entire system and add new fluid.

To insure your hydraulic system is clean, perform the following steps:

1. Clean (flush) the entire system to remove paint,, metal chips, welding shot, etc.

2. Filter each oil change to prevent introduction of contaminants.

3. Provide continuous oil filtration to remove sludge, products of wear and corrosion generated during the life of the system.

4. Provide protection to all areas that can introduce airborne contaminants into the system.

5. Perform regular servicing procedures of filters, breathers, and reservoirs.

C. Adding Fluid to the System

When hydraulic fluid is added to replenish the system, pour it through a fine wire screen (200 mesh or finer). DO NOT use a cloth to strain the fluid because lint may enter the system. When applicable, pump the fluid through a 10 micron filter or use a PFTU (porta filter and transfer unit). For PFTU information, order bulletin 366.

D. Hydraulic Fluid Recommendations

Hydraulic fluid within the system performs the dual function of lubrication and transmission of power. To insure proper lubrication, system life, and component reliability, fluid selection should be made carefully with the assistance of a reputable supplier. Fluid selection should be acceptable for use with all valves, motors and pumps within the system.

Data sheet I-286-S for oil selection is available from Vickers Technical Publications, Troy, MI 48007-0302.

The fluid recommendations noted in the data sheet are based on our experience in industry as a hydraulic component supplier. Where special considerations indicate a need to depart from these recommendations, see your Vickers sales representative.

E. Overload Protection

A relief valve must be installed in the system as close to the pump as possible. The relief valve limits pressure in the system to a prescribed maximum. The setting of the relief valve depends on the work requirements of the system.

F. Product Life

The longevity of these products is dependent upon environment, duty cycle, operating parameters and system cleanliness. Since these parameters vary from application to application, the ultimate user must determine and establish the periodic maintenance required to maximize life and detect potential component failure.

G. Troubleshooting

Table 4 lists the common difficulties experienced with pumps and hydraulic systems. It also indicates probable causes and remedies for each of the troubles listed.

TROUBLE	PROBABLE CAUSE	REMEDY
Erratic pressure	Foreign matter in system	Drain, flush and refill system with clean fluid.
	Worn poppet or seat in cover	Replace poppet and seat.
	Piston sticking in body or cover	Clean piston. Remove burrs by light lapping. Check freedom of movement on reassembly. Replace if necessary.
Low pressure or no pressure	Valve improperly adjusted	Adjust valve to proper setting.
	Vent connection open	Plug vent connection.
	Balance hole in piston plugged	Remove piston and clean out. If necessary, drain system and refill with clean fluid.
	Poppet in cover not seating	Back off adjusting screw several turns while running pump to be certain foreign matter is not caught on the seat. Check condition of seat, spring, and poppet if malfunction persists.
Excessive noise or chatter	High oil velocity through valve	Check valve flow rating. Replace with larger valve if necessary.
	Distorted control spring	Replace spring.
	Worn poppet or seat in cover	Replace poppet and seat.
	Excessive tank line pressure	Connect return port directly to tank.
	Vent line too long	Place a restriction, eg. needle valve or orifice plug in vent line next to relief valve.
	Valve setting too close to that of system operating pressure	Set relief valve at least 150 PSI higher than other valves in circuit.

Table 4. Troubleshooting Chart

Section VI – Overhaul

A. Unit Removal

CAUTION

Before breaking a circuit connection, make certain that power is off and system pressure has been released. Lower all vertical cylinders, discharge accumulators, and block any load whose movement could generate pressure.

1. Remove relief valve from system.

2. Drain appropriate hydraulic lines and remove the valve from system.

3. Cap all system openings to prevent contamination.

4. Place the relief valve on a clean work bench.

CAUTION

Absolute cleanliness is essential when working on a hydraulic system. Always work in a clean area. The presence of dirt and foreign materials in the system can result in serious damage or inadequate operation.

B. Service Tools

The following tools are recommended to overhaul a CG, CS, CT, or C*5 relief valve:

Standard Tools and Equipment:

1. A 6 inch crescent wrench.

2. One set of hex key wrenches with a socket adaptor.

3. Petroleum jelly or grease that is compatible with hydraulic fluids.

4. Cleaning solvent.

5. A small ball peen hammer.

6. One medium size screwdriver.

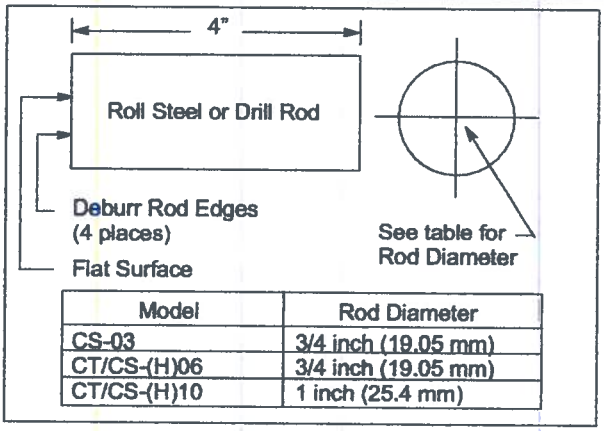
7. One torque wrench (0-250 lb. in.)

8. A clean work bench that is equipped with a vise.

9. Shop air (90 psi).

Special Tools:

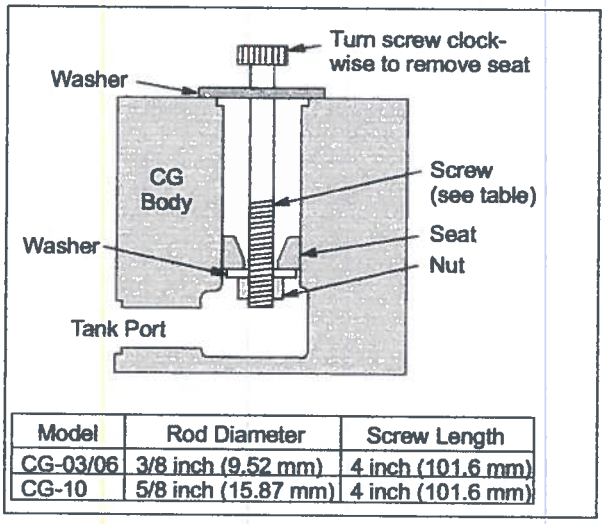
1. A piece of drill rod or roll steel to remove the seat within the valve body. See Figure 3.



Model	Rod Diameter
CS-03	3/4 inch (19.05 mm)
CT/CS-(H)06	3/4 inch (19.05 mm)
CT/CS-(H)10	1 inch (25.4 mm)

Figure 3. Disassembly Tool to Remove Seat (19) from Body (21)

2. One screw (approximately 4 inches long), two washers, and one nut. This particular tool is needed to remove the seat and/or sleeve from the body of CG (subplate mounted) models only. See Figure 4.



Model	Rod Diameter	Screw Length
CG-03/06	3/8 inch (9.52 mm)	4 inch (101.6 mm)
CG-10	5/8 inch (15.87 mm)	4 inch (101.6 mm)

Figure 4. Seat (19) Removal Tool (CG Models)

C. Disassembly

Periodic maintenance of the relief valve will generally not require disassembly to the extent described here. However, the following disassembly sequence can be used as a guide for partial disassembly. In general, disassembly is accomplished by item number sequence shown in Figure 5.

1.Thoroughly clean the valve exterior with cleaning solvent.

2. Secure valve body (21) in a vise.

3. Loosen lock nut (2).

4. Turn knob (1) counterclockwise and remove knob from valve cover (14).

NOTE

An adjusting screw replaces the knob on C*5 models.)

5. Remove parts (3) through (8). Inspect poppet (8) for damage to sealing surface. If poppet (8) is damaged, replace with a new cover subassembly.

6. Inspect seat (12) for nicks, scratches, and washout. If the seat shows evidence of damage, replace with a new cover subassembly. DO NOT attempt to remove seat (12) from cover (14).

7. If seat (12) is in good condition, remove plug (9), seal (10), and spacer (11).

NOTE

Space (11) exists on C*-10-**-** models only.)

8. Remove four screws (13) from cover (14), then disassemble the cover from body (21).

9. Remove parts (15) through (18) from body (21). Inspect piston (18) sealing surface for heavy scratches and other damage. Discard seal (15).

10. If piston (18) is damaged, turn valve body (21) in vise so tank port faces up. Insert a rod (reference Figure 3) into the tank port against seat (19.) Tap on rod end with hammer and remove the seat (19) from body (21). For C*-H**-30/50 models, insert rod against sleeve (20) and remove sleeve and seat at the same time.

NOTE

The following step refers to CG models only.

11. If piston (18) is damaged, secure body (21) in vise so mounting surface is face up. Insert a screw through seat (19). See Section VI, B and Figure 4 for removal of seat (19).

12. Remove plug (22) from body (21). Remove seal (23) from plug (22).

13. Discard seals (6), (10), (15) and (23).

D. Disassembly (C*5 Models)

Except for removal of the solenoid operated directional valve, the disassembly sequence of a C*5 valve is essentially the same as a standard relief valve.

1. Remove the four nameplate screws (a) and loosen nameplate (b) from directional valve cover (c).

2. Loosen four screws (d) and remove directional valve (e) from valve cover (f).

3. Discard seals (g).

4. Disassemble the relief valve per Section VI, C and follow Figure 5.

NOTE

This manual does not cover the repair and/or overhaul of solenoid operated directional valves. If the directional valve causes the relief valve to become inoperative, obtain the necessary parts and service information for directional valves.

E. Inspection, Repair & Replacement

NOTE

All parts must be thoroughly cleaned and kept clean during inspection and assembly. The close tolerance of the parts makes this requirement very important.

NOTE

Reliable operation throughout the specified operating range is assured only if genuine Vickers parts are used. Sophisticated design processes and materials are used in the manufacture of our parts. Substitutions may result in early failure.

NOTE

Replace all parts that do not meet the following specifications.

1. Inspect all screws (13) for evidence of damaged threads. If threads are damaged, replace the screws.

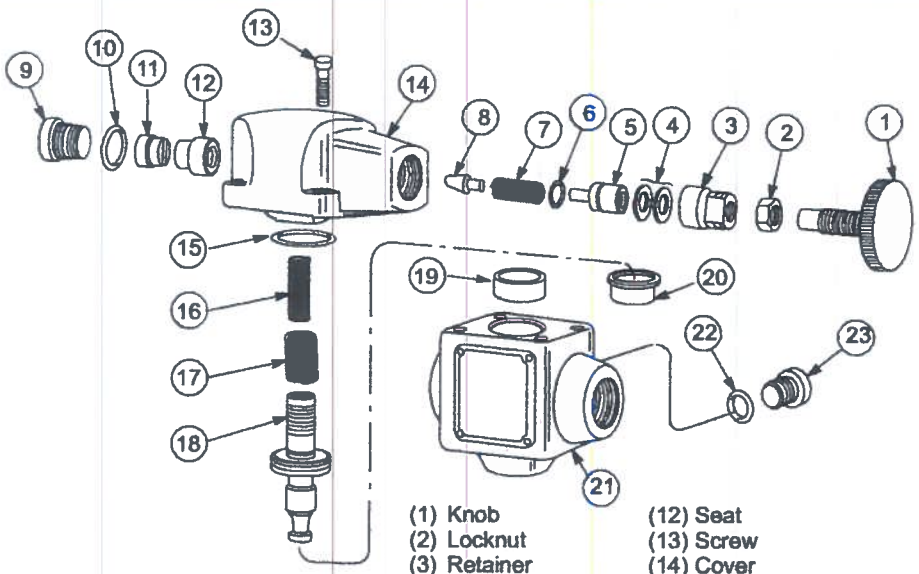
2. Inspect springs (7), (16), and (17) for distortion or damaged coils. Replace springs if coils are damaged.

3. Inspect the piston (18) to cover (14) clearance. Insert the piston into the cover and check for looseness. A close tolerance fit is mandatory for proper valve operation. If a loose fit is noted, the cover is worn and must be replaced.

4. Inspect the piston (18) to body (21) clearance. The piston should have a close tolerance fit as noted in step 3. If the piston is loose inside the body bore, replace the body and seat (19).

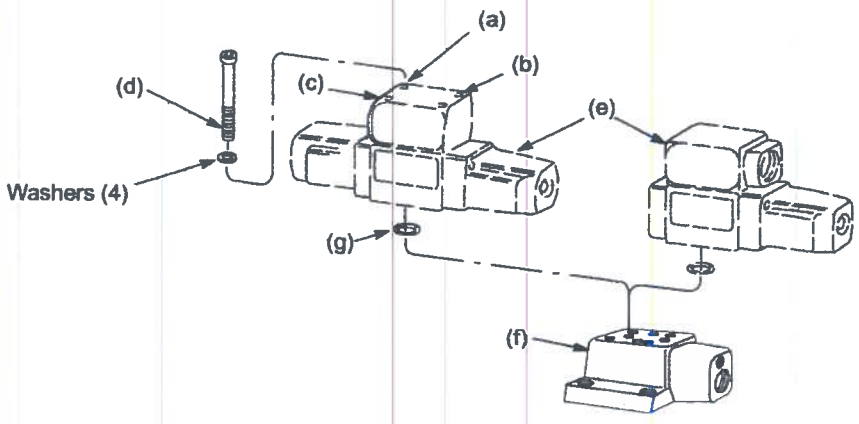
5. Inspect piston (18) for nicks or scratches across the sealing surface. Make sure the balance hole in the piston is free from foreign material. Remove minor scratches on piston with 500 grit polishing paper. If the piston has heavy scratches, replace the piston (18), seat (19), and body (21).

6. Inspect poppet (8) and seat (12) for heavy wear or evidence of washout. Replace both the poppet and seat if heavy wear or washout is noted.



(1) Knob
(2) Locknut
(3) Retainer
(4) Spacer
(5) Plunger
(6) Seal
(7) Spring
(8) Poppet
(9) Plug
(10) Seal
(11) Restriction Plug (10 size only)
(12) Seat
(13) Screw
(14) Cover
(15) Seal
(16) Spring (Omitted on C*-H06-**-50 model)
(17) Spring (High-vent 'V' models)
(18) Piston
(19) Seat
(20) Sleeve (High-flow 'H' models)
(21) Body
(22) Plug
(23) Seal

Figure 5. -50 Design Relief Valves



(a) Screw (4)
(b) Name Plate
(c) Directional Valve Cover
(d) Screw (4)
(e) Directional Valve
(f) Relief Valve Cover
(g) Seals

Figure 6. C*5 Solenoid Controlled Relief Valve

7. If seat (19) was removed during disassembly, make sure inside of body (21) is clean and free from damage.

8. Inspect mounting surfaces on cover and body for burrs, nicks, or scratches. Remove burrs and/or scratches with India stone or polishing paper. Also check body and cover for damaged or worn threads. If threads are worn or damaged, replace the part.

F. Assembly

Assembly of parts will be in reverse numerical sequence as shown in Figure 5. Obtain new seals. Seal kits are noted on the parts and service drawings that are tabulated in Section I, B. Make sure all parts are clean prior to assembly. Lubricate all parts with a light film of clean hydraulic fluid.

1. Secure body (21) in a vise.

2. If sleeve (20) was removed during disassembly, insert the sleeve into bottom of body bore.

NOTE

This step applies to C*-H**-30/50 models only.

3. If seat (19) was removed, install new seat into body (21) as follows:

a. Lubricate seat with petroleum jelly or grease that is compatible with system fluid.

b. Position the seat square over the body bore. Place a rod against the seat. Hold the rod centered. Tap on end of rod with hammer until seat is started into body, then drive the seat into the body bore until it bottoms out. Inspect the body and seat to be sure no chips or metal shavings were developed.

4. Install parts (18) through (15).

NOTE

Spring (16) is used on high vent models only ('V' in the model code).

5. Slide piston (18) back and forth within the body bore. Also rotate the piston 360° to make sure piston movement is free and without bind.

6. Assemble cover (14) to body (21). Cross tighten four screws (13) evenly. Torque the screws to 14.9-20.3 Nm. (133-178 lb. in.).

7. Secure valve body in vise to a horizontal position. Place screwdriver or similar tool in tank port against bottom of piston (18). Push the piston up and down within the body. If the piston hangs up or binds, loosen screws (13) on cover (14) to snug condition. Lightly tap around cover perimeter with a soft tip hammer until the piston moves freely within the body bore. Retighten the cover screws.

8. Install parts (11) through (9).

NOTE

Restriction plug (11) exists in C*-10-** models only. Torque plug (9) to 22.6-27.1 Nm. (200-240 lb. in.).

9. Install parts (8) through (3). Be sure to install the same quantity of spacers (4) that were removed. The spacers determine the pressure adjustment range of the valve. Make sure seal (6) is assembled on plunger (5).

10. Install parts (2) and (1). Thread knob (1) in retainer (3) approximately five complete turns.

NOTE

The following step applies to C*5 solenoid operated relief valves only.

11. Assemble directional valve on cover in reverse alphabetical sequence as shown in Figure 6. Torque screws (d) to 5.6 Nm. maximum (50 lb. in.).

Section VII – Start-up and Test

A. Start-up

Start the system and sequence the unit through all positions while watching for appropriate movement of actuators. Improper or erratic movement of the actuators may indicate incorrect assembly of the unit or presence of trapped air.

B. Test

A test stand having regulated flow, temperature control and special fixtures is required to fully test the performance of the rebuilt unit. Because of this, only the functional test shown in the start-up paragraph is given. If such a test stand is available, test the unit to the requirements set forth in the installation drawings.

Eaton Hydraulics
15151 Highway 5
Eden Prairie, MN 55344
Telephone: 612 937-7254
Fax: 612 937-7130
www.eatonhydraulics.com

46 New Lane, Havant
Hampshire PO9 2NB
England
Telephone: (44) 170-548-6451
Fax: (44) 170-548-7110

Vickers®

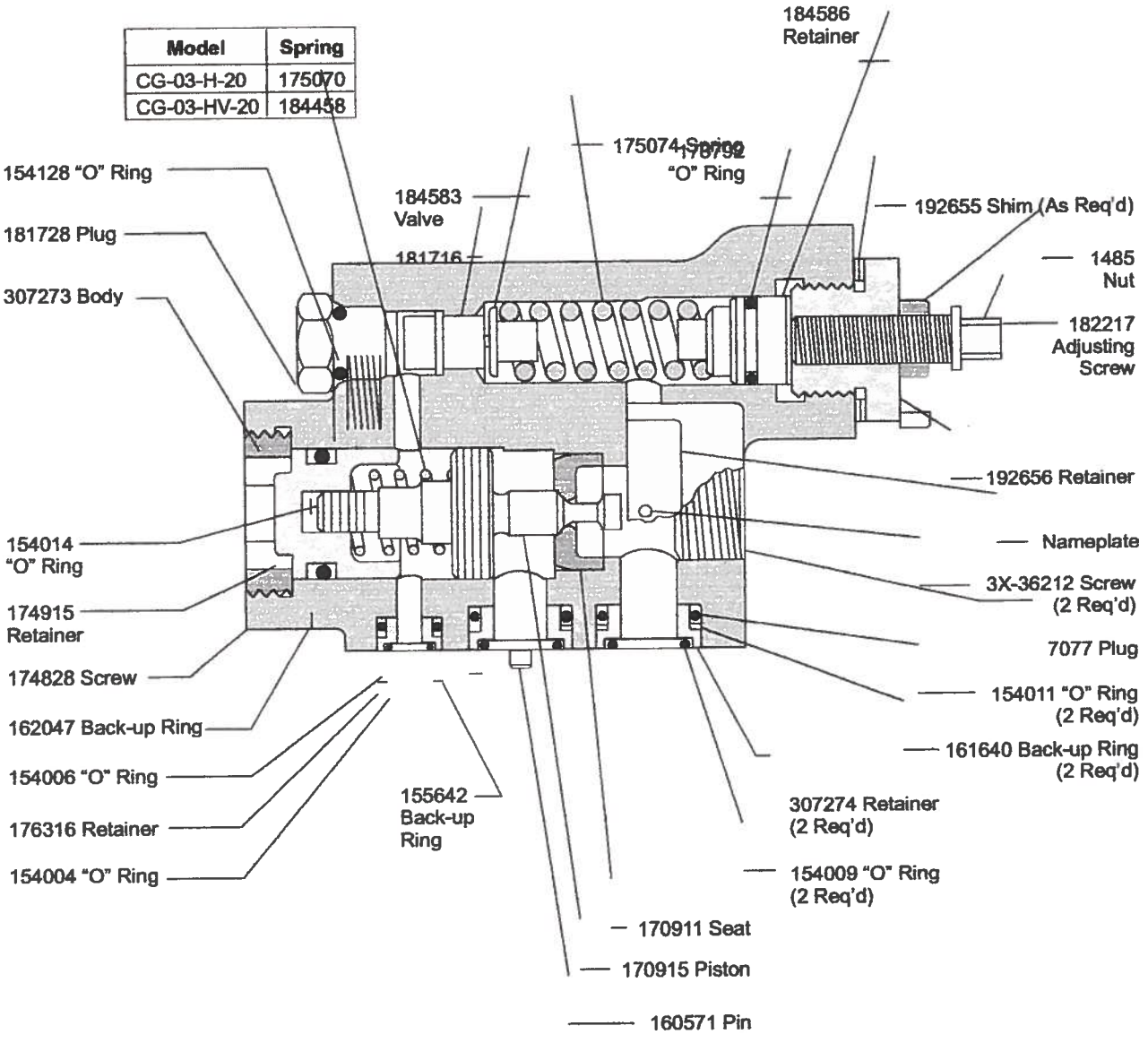
Service Data

Relief Valves

High Pressure Relief Valves

CG-03-H(V)-20

Model	Spring
CG-03-H-20	175070
CG-03-HV-20	184458



Model Code

CG - 03 - H (V) - 20

1 **Model Series**

CG - Gasket mounted relief valve

2 **Size**

3/8 inch

3 **Adjustment Pressure**

2500 to 5000 PSI

4 **Vent Pressure**

V -High vent pressure
Omitted -Low vent pressure

5 **Design**

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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Service Data

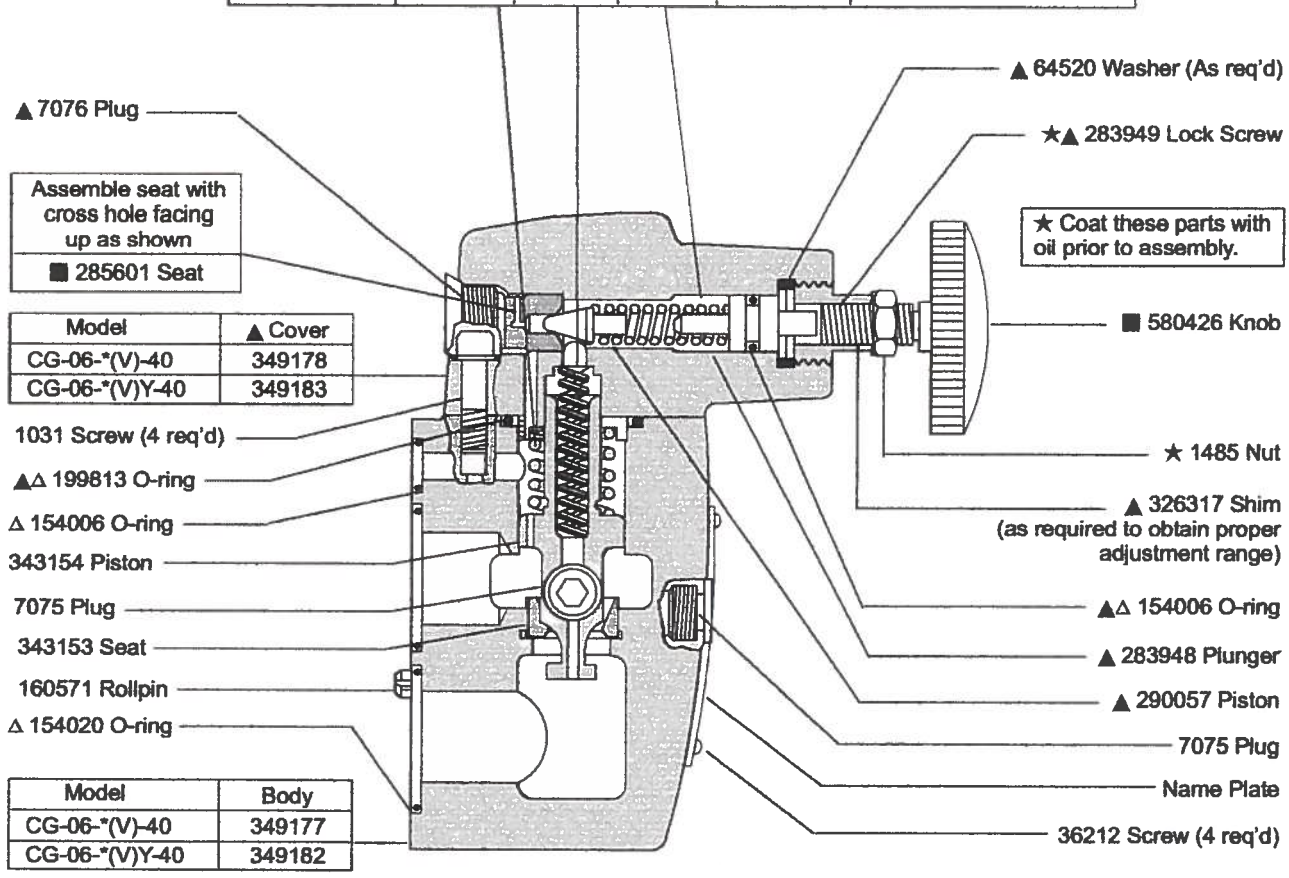
Vickers®

Relief Valves

Balanced Piston Type Relief & Sequence Valve

CG-06-*-(V)(Y)-40

Model	Spring	Spring	Spring	Pressure Range PSI	Cover S/A Includes Parts Marked ▲
CG-06-B-40	–	2077	▲2280	125-1000	942037
CG-06-BY-40					–
CG-06-BV-40	184458	2077			942037
CG-06-BVY-40					–
CG-06-C-40	–		▲2282	500-2000	942038
CG-06-CY-40					–
CG-06-CV-40	184458	2077			942038
CG-06-CVY-40					–
CG-06-F-40	–		▲2281	1500-3000	942039
CG-06-FY-40					–
CG-06-FV-40	184458	2077			942039
CG-06-FVY-40					–



Model	▲ Cover
CG-06-*(V)-40	349178
CG-06-*(V)Y-40	349183

Model	Body
CG-06-*(V)-40	349177
CG-06-*(V)Y-40	349182

NOTE

Two additional 154006 O-rings are required in models CG-06-*(V)Y-40. These are included in Seal Kit.

△ Included in 919417 Seal Kit

Equivalent F3 Seal Kit 919444

VICKERS

Model Code Breakdown

C G - 06 - * - (V) (Y) - 40

1 2 3 4 5 6

1 Model Series

CG - Relief valve, gasket mounted

2 Size

06 - 3/4 inch

3 Pressure Range

B - 125-1000 PSI
C - 500-2000 PSI
F - 1500-3000 PSI

4 Vent Pressure

V - High vent pressure
(Omit for standard vent pressure.)

5 External Drain Feature

Y - Sequence valve
(Omit for standard relief.)

6 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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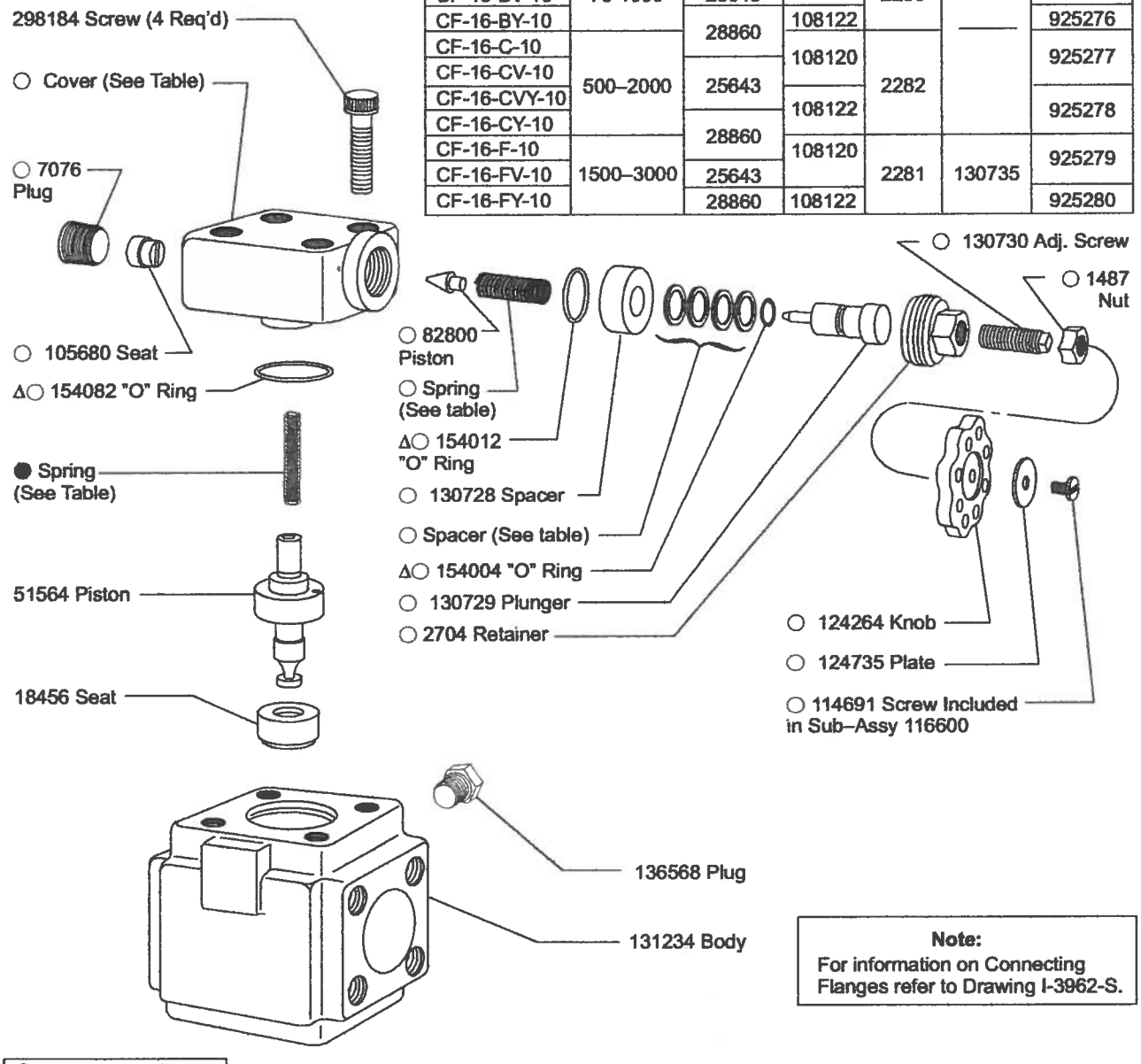
Valves

Relief Valves

CF16/24 Series

Model	Pressure Range	● Spring	Cover	Spring	Spacer	Cover Sub-Assy.
CF-16-B-10	75-1000	28860	108120	2280		925275
CF-16-BV-10		25643				
CF-16-BY-10		28860	108122			925276
CF-16-C-10	500–2000		108120	2282		925277
CF-16-CV-10		25643				
CF-16-CVY-10			108122			925278
CF-16-CY-10		28860				
CF-16-F-10	1500–3000		108120	2281	130735	925279
CF-16-FV-10		25643				
CF-16-FY-10		28860	108122			925280

CF-16-*10 Series

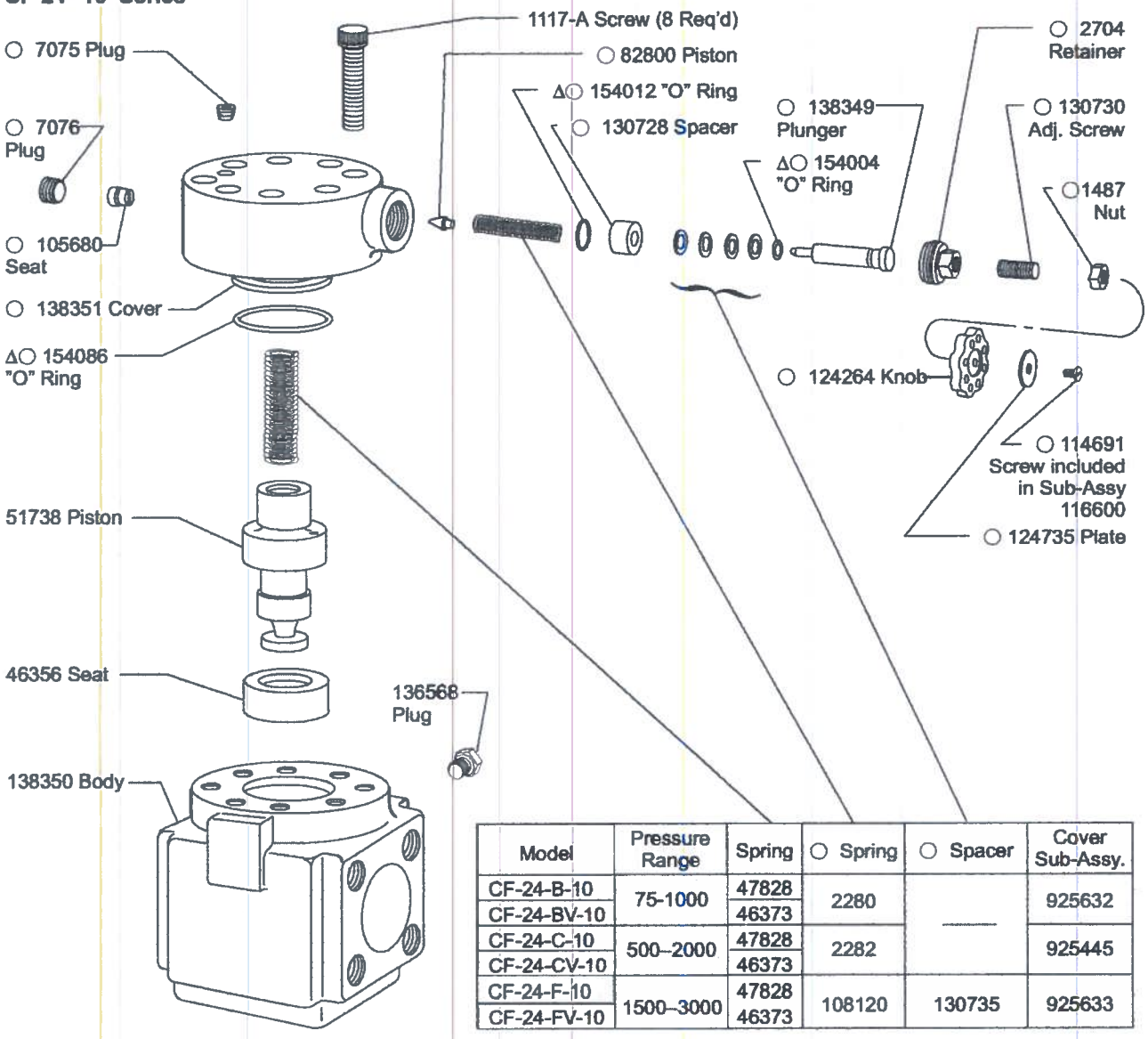


Note:
For information on Connecting Flanges refer to Drawing I-3962-S.

○ Included in Cover Sub–Assy.

▲Included in Seal Kit 919323

CF-24-*10 Series



Model	Pressure Range	Spring	○ Spring	○ Spacer	Cover Sub-Assy.
CF-24-B-10	75-1000	47828	2280	—	925632
CF-24-BV-10		46373			
CF-24-C-10	500–2000	47828	2282		925445
CF-24-CV-10		46373			
CF-24-F-10	1500–3000	47828	108120	130735	925633
CF-24-FV-10		46373			

○ Included in Cover Sub-Assy.

▲Included in Seal Kit 919323

Note:
For information on Connecting Flanges refer to Drawing I-3962-S.

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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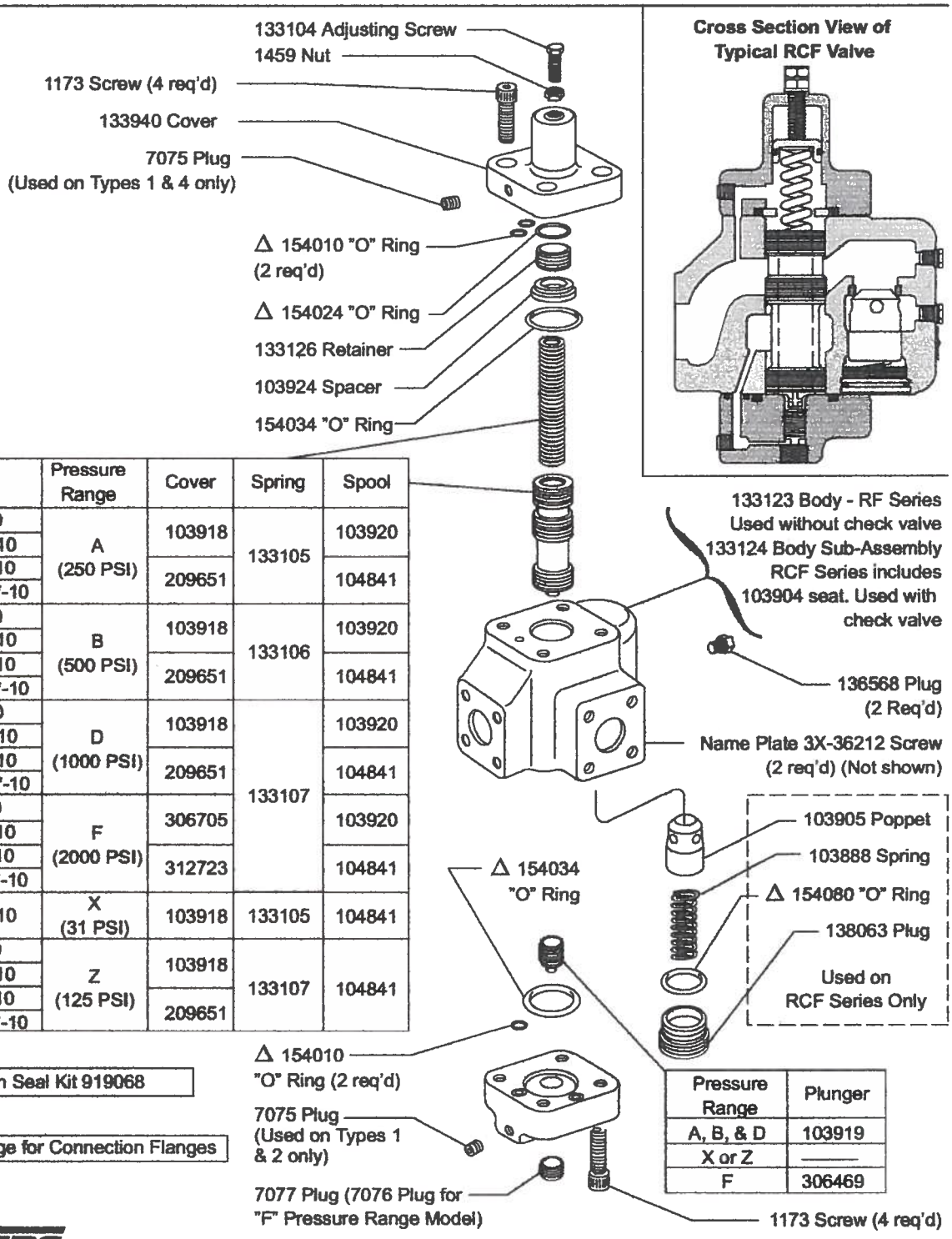
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

RF & RCF-16-*P*-10
RF & RCF-16--10**



Model	Pressure Range	Cover	Spring	Spool
RF-16-A*-10	A (250 PSI)	103918	133105	103920
RCF-16-A*-10				
RF-16-AP*-10		209651		104841
RCF-16-AP*-10				
RF-16-B*-10	B (500 PSI)	103918	133106	103920
RCF-16-B*-10				
RF-16-BP*-10		209651		104841
RCF-16-BP*-10				
RF-16-D*-10	D (1000 PSI)	103918	133107	103920
RCF-16-D*-10				
RF-16-DP*-10		209651		104841
RCF-16-DP*-10				
RF-16-F*-10	F (2000 PSI)	306705		103920
RCF-16-F*-10				
RF-16-FP*-10		312723		104841
RCF-16-FP*-10				
RCF-16-X*-10	X (31 PSI)	103918	133105	104841
RF-16-Z*-10	Z (125 PSI)	103918	133107	104841
RCF-16-Z*-10				
RF-16-ZP*-10		209651		
RCF-16-ZP*-10				

Pressure Range	Plunger
A, B, & D	103919
X or Z	——
F	306469

Δ Included in Seal Kit 919068

See back page for Connection Flanges

VICKERS

Model Code

R (C) F - 16 - * (P) * - 10

1 2 3 4 5 6 7 8

1 Model Series

R - Pressure control valve

2 Check Valve

C - With integral check valve (reverse free flow)
(Omit without check valve.)

3 Flange Connection

4 Valve Size

2" nominal

5 Pressure Rating

A - 250 PSI
B - 500 PSI
D - 1000 PSI
F - 2000 PSI
Z - 125 PSI

6 Control

P - Auxiliary Control (May be used with any of the 4 valve types shown)
(Omit for standard control.)

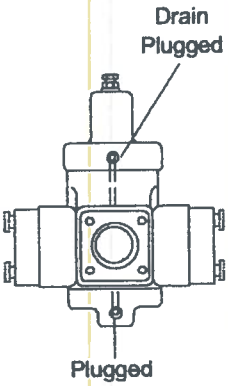
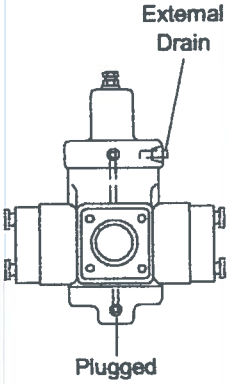
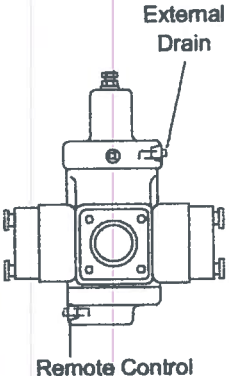
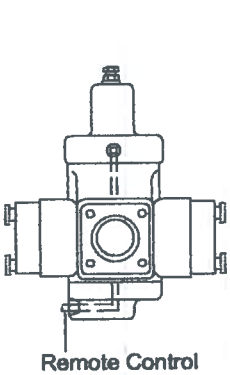
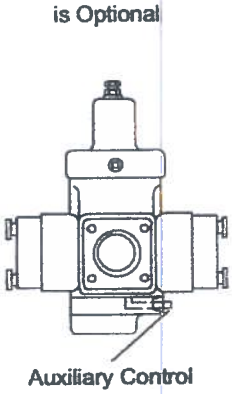
7 Valve Types

(Inset views at bottom of page show the cover positions for valve types 1 through 4.)

8 Design

Flange Connections (Not furnished with Unit)		
Model	Pipe Size	Type
FL-12-PS-20	1-1/2"	Straight
FL-16-PS-20	2"	
FL-12-PL-20	1-1/2"	ELL
FL-16-PL-20	2"	
Flanges are furnished with a seal, screws and washers for fastening		

Note: Assemble covers as shown to obtain valve action desired.

Type 1	Type 2	Type 3	Type 4	"P" Feature
Directly Controlled Internal Drain	Directly Controlled External Drain	Remotely Controlled External Drain	Remotely Controlled Internal Drain	Auxiliary Control Valve Type is Optional
				
Drain Plugged; Plugged	External Drain; Plugged	External Drain; Remote Control Connection	Remote Control Connection	Auxiliary Control Connection

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Overhaul Manual

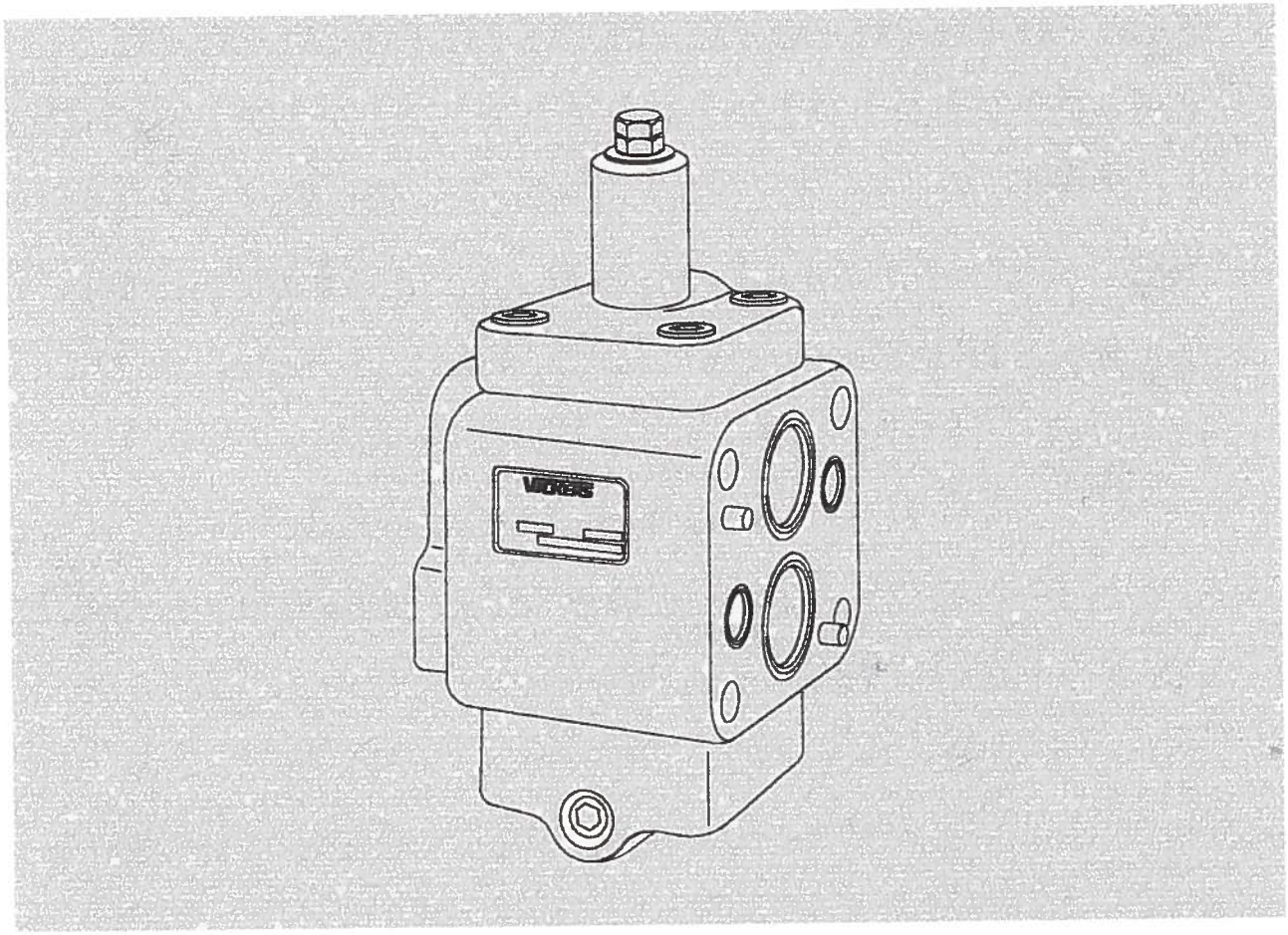
Vickers®

Pressure Relief

EATON

Pressure Control Valves Hydro-Cushion Type

RF, RG and RT Series
RCF, RCG and RCT Series



VICKERS

Revised 9/1/87

I-3332-S

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Section I – Operating Characteristics

Type ..... Hydro-cushion pressure control valves
Operating Fluid ..... High quality lubricating oil
Recommend Viscosity ..... 100-250 SSU @ 100° F.

Operating Pressure ..... Maximum 2000 PSI
Port Connections ..... Flange, gasket or threaded
Mounting Position ..... Optional

Model	Port Size	Capacity GPM	Parts Drawing	Installation Drawing	
				"RC" Series	"RC" Series
RT/RCT-03-**-1*	3/8 inch	8	I-3325-S	I-132395	I-132396
RG/RCG-03-**-1*			I-3329-S	I-133101	I-133103
RT/RCT-06-**-1*	3/4 inch	20	I-3326-S	I-132395	I-132396
RG/RCG-06-**-1*			I-3330-S	I-133101	I-133103
RT/RCT-10-**-1*	1 1/4 inch	50	I-3327-S	I-13395	I-13296
RG/RCG-10-**-1*			I-3331-S	I-133101	I-133103
RT/RCT-12-**-1*	1 1/2 inch	65	I-3327-S	I-132395	I-132396
RF/RCF-16-**-1*	2 inch	125	I-3328-S	I-133671	I-133672

Table 1. 2.

R (C) T O - 06 - D P 2 - 10

1 2 3 4 5 6 7 8 9

1 Valve Type 3.
Pressure control

2 Valve Design
C - with integral check valve
(Reverse free flow)
Omitted - Without check valve
(no reverse flow)

3 Installation
F - Flange connected
G - Gasket mounted
T - Threaded connections

4 Special Feature
O - Normally open spool
(decompression circuits)
Omitted - Normally closed spool
(standard)

5 Port Connections
Nominal Pipe Size
03 - 3/8" female pipe thread
06 - 3/4" female pipe thread
10 - 1 1/4" female pipe thread
12 - 1 1/2" female pipe thread
16 - 2" flange female pipe thread

6 Pressure Rating
A - 75-250 PSI (with pilot piston)
B - 125-500 PSI (with pilot piston)
D - 250-1000 PSI (with pilot piston)
F- 500-2000 PSI (with pilot piston)
Z - 25-125 PSI (without pilot piston)

7 Special Application
P - Auxiliary external pilot
pressure control
Omitted standard control

8 Circuit Application
1 - "R" Series, relief valve
(internal drain directly operated)
"RC" Series, counter balance valve
(internal drain directly operated)
2 - Sequence Valve
(external drain remotely operated)
3 - Sequence Valve
(external drain remotely operated)
4 - "R" series, unloading valve
(internal drain remotely operated)
"RC" series, counter-balance valve
(internal drain remotely operated)

9 Design Number

9 Design Modification

Table 1. Model Code Breakdown

4.

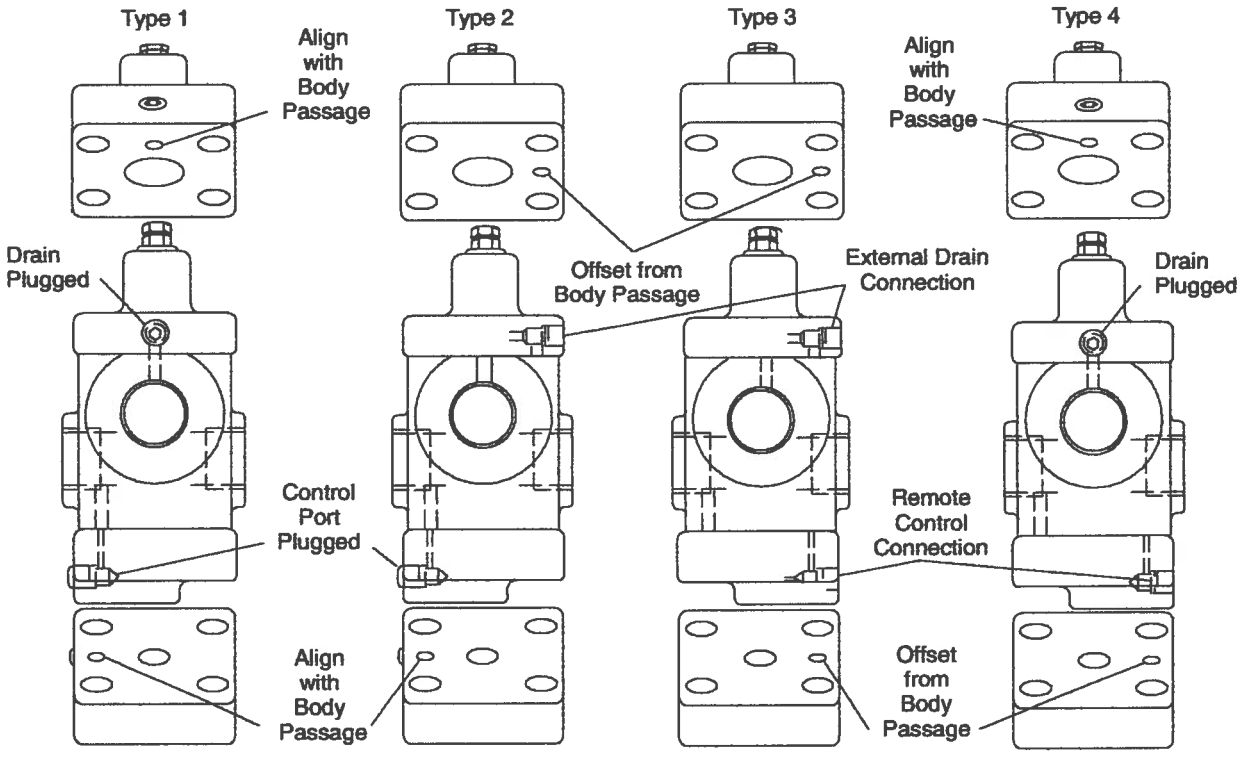
For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from pressure, return, and in-line filter series are recommended.

Section II – Description

This manual contains operation, service and overhaul information for Vickers hydro-cushion type pressure control valves.

The "R" and the "RC" series valves are identical in operation except the "R" series limits flow to one direction - from the primary port to the secondary port. The "RC" series, provided with an integral check valve, permits reverse free flow from the secondary port to the primary port when the valve is closed.

Since these valves can be internally or externally drained, directly or remotely operated, they are adaptable to a wide range of applications depending on the position of the covers in relation to the body.



NOTE:
Cover positions illustrating threaded style valves apply to gasket mounted valves also, except the cover ports remain plugged. External connecitons are made directly to the mounting surface or subplate fo the RG, RCG Series.

Figure 1. 6.

The four standard combinations are designated as Types 1, 2, 3, and 4. Each type is available with or without the integral check valve, permitting reverse free flow.

TYPE 1 - is internally drained and directly operated. It is used as a relief valve for overload protection when the system pressure does not exceed 500 PSI. In this application the secondary port is connected directly to tank. Or, if provided with the integral check valve, it can be used as a counterbalance or brake valve.

TYPE 2 - is externally drained and directly operated. It is used as a sequence valve permitting pressure buildup for the second phase of a two phase cycle, while maintaining a minimum pressure at the primary port for a holding operation, i.e., a clamp and work stroke cycle.

TYPE 3 - is externally drained and remotely operated. It is used as a sequence valve in the same manner as **Type 2** except, being remotely operated, the valve can be used to sequence independently of the primary pressure when provided with a separate pressure source.

TYPE 4 - is internally drained and remotely operated. It is used primarily as an unloading valve where the secondary port must be connected directly to tank. Application of external pressure permits the valve to open fully independent of the primary pressure. Type 4 valves can also be used as remotely operated counterbalance or brake valves when provided with the integral check valve.

Section III – Installation

The RT, RCT series with threaded connections and the RF, RCF series valves with flange connections are usually installed directly in the supply line. Fluid flow is through the primary pressure ports on opposite side of the valve body. The single, secondary port, on the side of the valve adjacent to the primary port, is connected to tank or to the secondary circuit depending on the application and type of valve used.

The RG, RCG series gasket mounted valves are teed into the supply line. The tee connection is piped to the bottom, or pressure port in the subplate, or to the back surface of the mounting area. The top, or secondary, port is piped to tank or to the secondary circuit with the covers arranged for internal or external drain and direct or remote control depending on the valve action required.

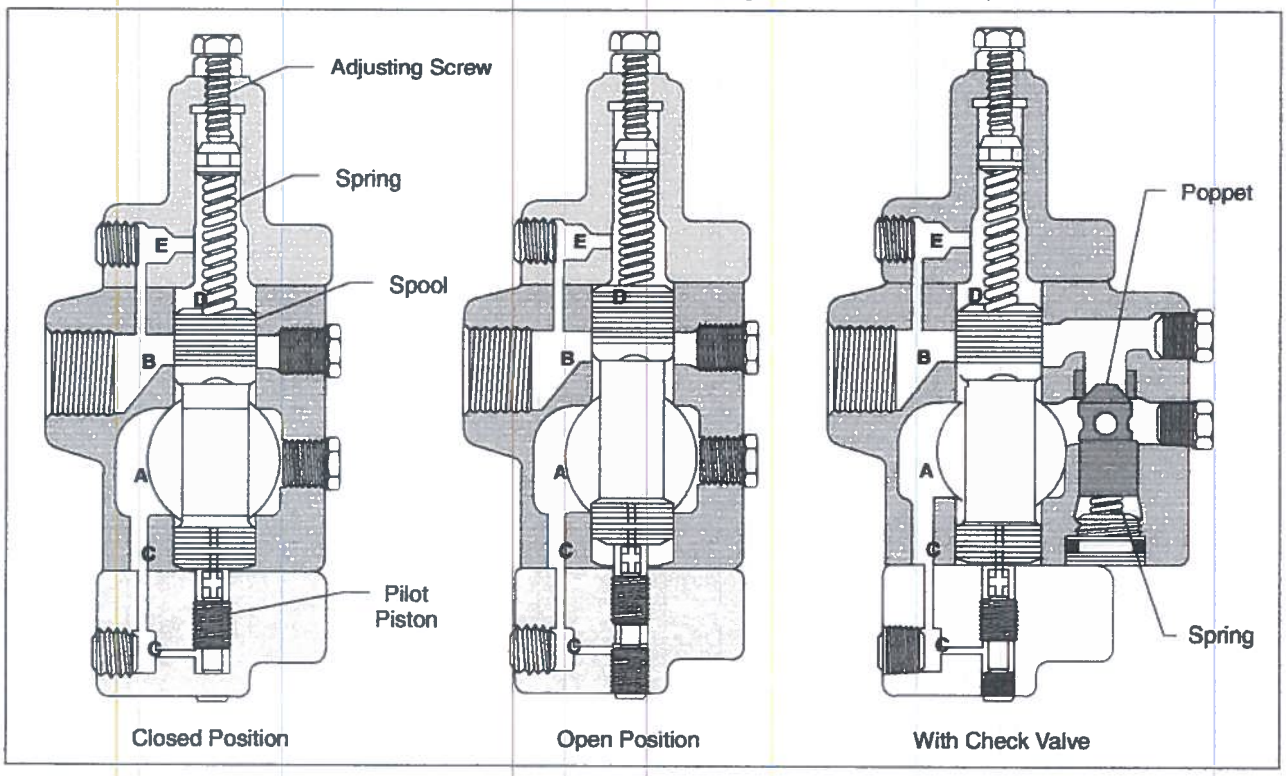


Figure 2. 8.

Section IV – Operation

Figure 2 illustrates the basic operation of the various types of valves. The point at which the valve begins to function is determined by the position of the adjusting screw (which varies the force exerted by the spring on the spool) referred to as the pressure setting of the valve. Clockwise rotation of the screw increases pressure. Counterclockwise rotation decreases pressure.

The effective areas of the spool exposed to hydraulic pressure in primary chamber A being equal, the spool is hydraulically balanced and held in a normally closed position by the force of the spring. When pressure is primary chamber A - which is effective on the piston through passages C - exceeds the adjusted pressure setting, the piston is forced upward moving the spool accordingly.

The spool moving upward opens secondary chamber B permitting pump delivery to flow into the secondary circuit, while maintaining a minimum pressure in primary chamber A equal to the pressure setting of the valve.

When the primary pressure decreases, compression of the spring overcomes the hydraulic force effective on the piston and spool closes blocking flow to chamber B.

Fluid leakage trapped between the piston and the spool escapes through the center hole of the spool, into spring chamber D, through drain passage E to chamber B and tank, or externally to tank depending on the position of the top cover.

Valves with pressure ratings identified as A, B, D or F, require the pilot piston in the bottom cover.

Valves of the Z (or low pressure rating) do not use the pilot piston, but use a spool without the center drain hole, in order to prevent the pilot fluid from escaping through the drain passage.

In addition to the basic units, some models may include special features for specific applications.

Model code breakdown on page 4, describes in detail the valve types, pressure ranges and special applications available.

Figure 3 schematically illustrates two special feature valves. The normally open spool is identified by the letter O in the model number and the auxiliary remote control feature is identified by the letter P in the model number.

Section V – Special Features

The normally open spool type, used with a special counter-balance or decompression control requires a needle valve or orifice installed between the primary port and the secondary port to accomplish the decompression feature.

Operation of this valve when used with a gravity returned single acting ram is such that pump fluid passes free flow into secondary chamber B, then through the check valve and chamber A into the ram. Pressure buildup in the ram closes the spool.

When the work stroke is completed, fluid flow is diverted from the secondary port by directing the pump delivery to tank.

On the return stroke, trapped fluid under pressure in the primary port holds the valve spool and check valve closed until a small amount of fluid bleeding off through the needle valve or orifice reduces the trapped pressure.

When pressure drops below the valve setting, the spring forces the valve spool to open directing the discharge flow through the secondary port to tank.

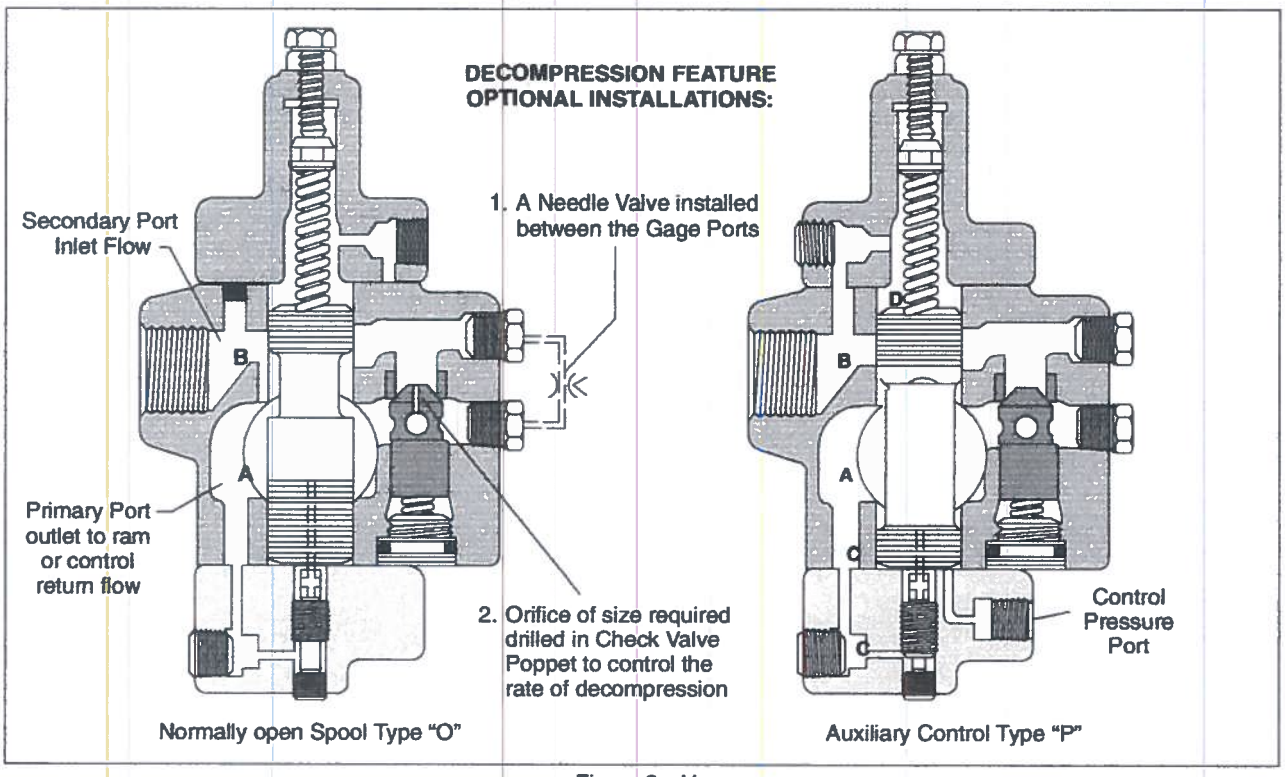

DECOMPRESSION FEATURE
OPTIONAL INSTALLATIONS:
1. A Needle Valve installed between the Gage Ports
Secondary Port Inlet Flow
Primary Port outlet to ram or control return flow
2. Orifice of size required drilled in Check Valve Poppet to control the rate of decompression
Control Pressure Port
A
B
C
D
Normally open Spool Type "O"
Auxiliary Control Type "P"

Figure 3. 11.

Valves with the "P" feature, auxiliary remote control are available in both the R* and the RC* series.

These valves may be used to stop the movement of a hydraulic cylinder or motor by providing hydraulic braking when the driving force is removed.

Because of the difference in effective areas between the bottom of the spool and the bottom of the pilot piston, the external pilot pressure needed to open the valve to resume movement is only one-eighth of the internal pilot pressure required for the A, B or D rated valves and one-sixteenth of the internal pressure required by the F rated valves.

Operation is such that the cylinder or motor is maintained in a fixed position when force is removed until pilot pressure applied to the large area of the spool, overcomes the spring force. This permits the discharge fluid to pass through the primary port into the secondary port and back to tank.

The integral check valve permits free flow from the secondary port to the primary for reversing action of the cylinder or motor.

Section VI – Overhaul

CAUTION

Before breaking any circuit connections, be certain the electrical power is off and all branches of the circuit are relieved of trapped pressure. Lower all vertical cylinders. Discharge or isolate accumulators. Block any load whose movement could cause injury to personnel or damage to the equipment.

A. Disassembly 13.

If a valve fails to function properly, the trouble can often be corrected without removing the valve from the installation. This can be accomplished in the following manner.

1. Back off the adjusting screw full length to relieve all compression on the spring.

2. Remove top cover screws, cover and spring.

3. Check the valve spool for binding or excessive clearance in the body bore. Be sure the pilot pistons remains in the bottom cover during the process.

4. If the spool checks out satisfactorily, remove the bottom cover. Check the pilot piston for burrs or excessive clearance in the cover bore.

5. Check the bottom cover for clogged control passages. See Trouble Shooting Table 3.

For complete disassembly (See Figure 4), remove the valve from the installation. Dismantle in the same order as the key index numbers assigned to the exploded view.

B. Reassembly 14.

Reassemble in reverse order of disassembly. Follow key index numbers in Figure 4 in reverse order.

NOTE

In reassembling the valves, the position of the drain passage in the top cover in relation to the drain passage in the body, and the position of the control fluid passage in the bottom cover in relation to the body passage, determines the type or function of the valve. See Figure 1 for cover positions.

1. Adjusting Screw
2. Locknut
3. Cover Screw
4. Cover - Top
5. Plug - Drain Port
6. Seals or Gasket
7. Plug
8. O-Ring
9. Spring
10. Spool
11. Cover Screw
12. Cover - Bottom
13. Seals or Gasket
14. Piston
15. Plug
16. Plug
17. Body - RT Series
18. Body - RCT Series
19. Body - RG Series
20. Body - RCG Series
21. Body - RF Series
22. Body - RCF Series
23. Screw - Mtg.
24. Plate - Mtg.
25. Seal
26. Seal
27. Plug
28. Plug
29. Seal
30. Spring
31. Poppet
32. Seat

33. Neoprene Plug - Used on external drain models only.
34. Neoprene Plug - Used on remote control models only.

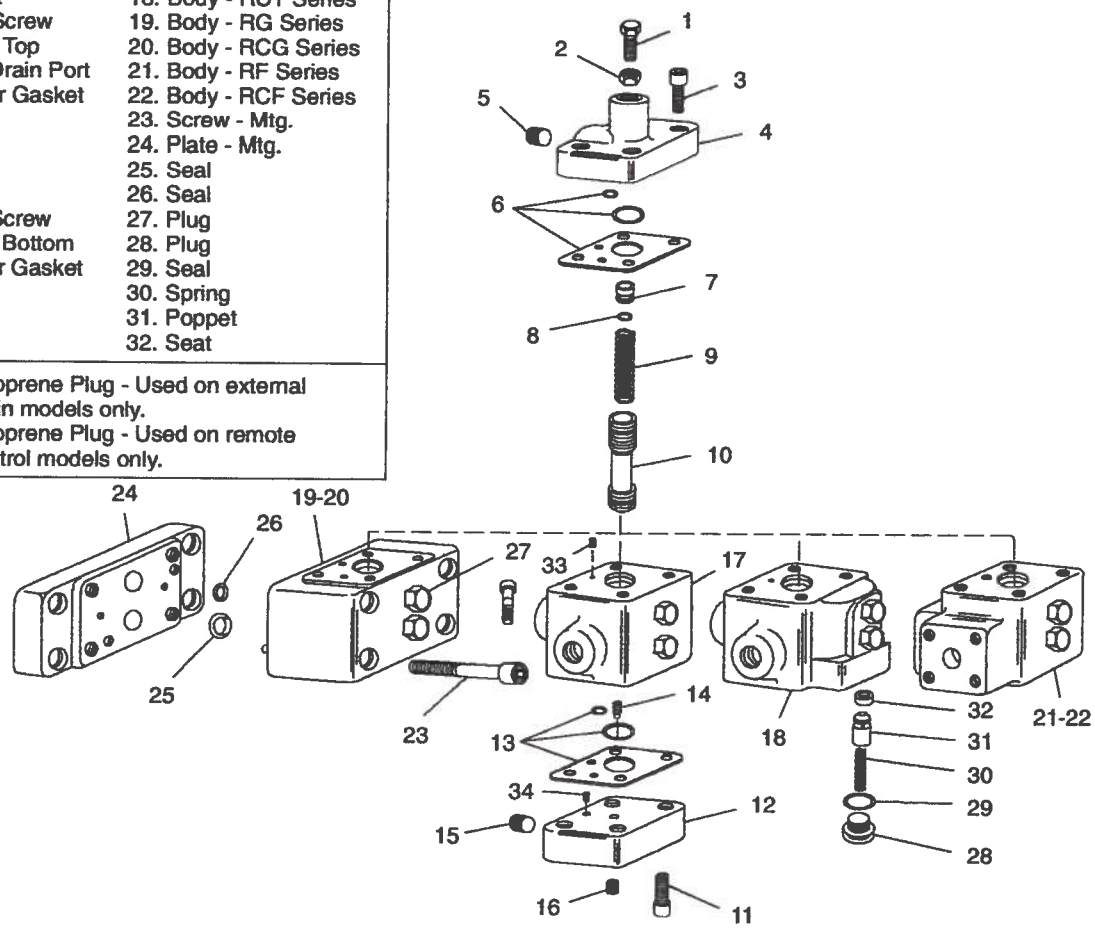


Figure 3. 15.

E. Troubleshooting Chart

Trouble	Possible Cause	Remedy
Erratic Pressure	1. Foreign matter in the system. Spool binding in the body bore.	Drain, flush and refill system with clean fluid. Check spool for excessive wear or burrs. Remove burrs with India Stone. Check body bore for wear or out-of-round. RT and RCT series, check the connecting piping for excessive tightness distorting body.
Premature Valve Action (Low Pressure)	1. Valve improperly adjusted. 2. Drain hole through main spool plugged. 3. Main spool stuck in open position. 4. Control piston binding in up position.	Readjust valve to proper setting. Remove spool. Blow out hole with filtered compressed air. Remove spool. Check for burrs, foreign matter, excessive wear, out-of-round body bore. RG and RCG series, inspect valve mounting surfaces for flatness. Remove bottom cover. Check piston for burrs.
Delayed Valve Action (High Pressure)	1. Control piston binding in bottom position. 2. Control fluid passage in bottom cover plugged.	Check for burrs, foreign matter or excessive wear. Remove cover. Clear obstruction from control passage and blow clean with compressed air.

Table 3. Trouble Shooting Chart

Eaton Hydraulics
15151 Highway 5
Eden Prairie, MN 55344
Telephone: 612 937-7254
Fax: 612 937-7130
www.eatonhydraulics.com

46 New Lane, Havant
Hampshire PO9 2NB
England
Telephone: (44) 170-548-6451
Fax: (44) 170-548-7110

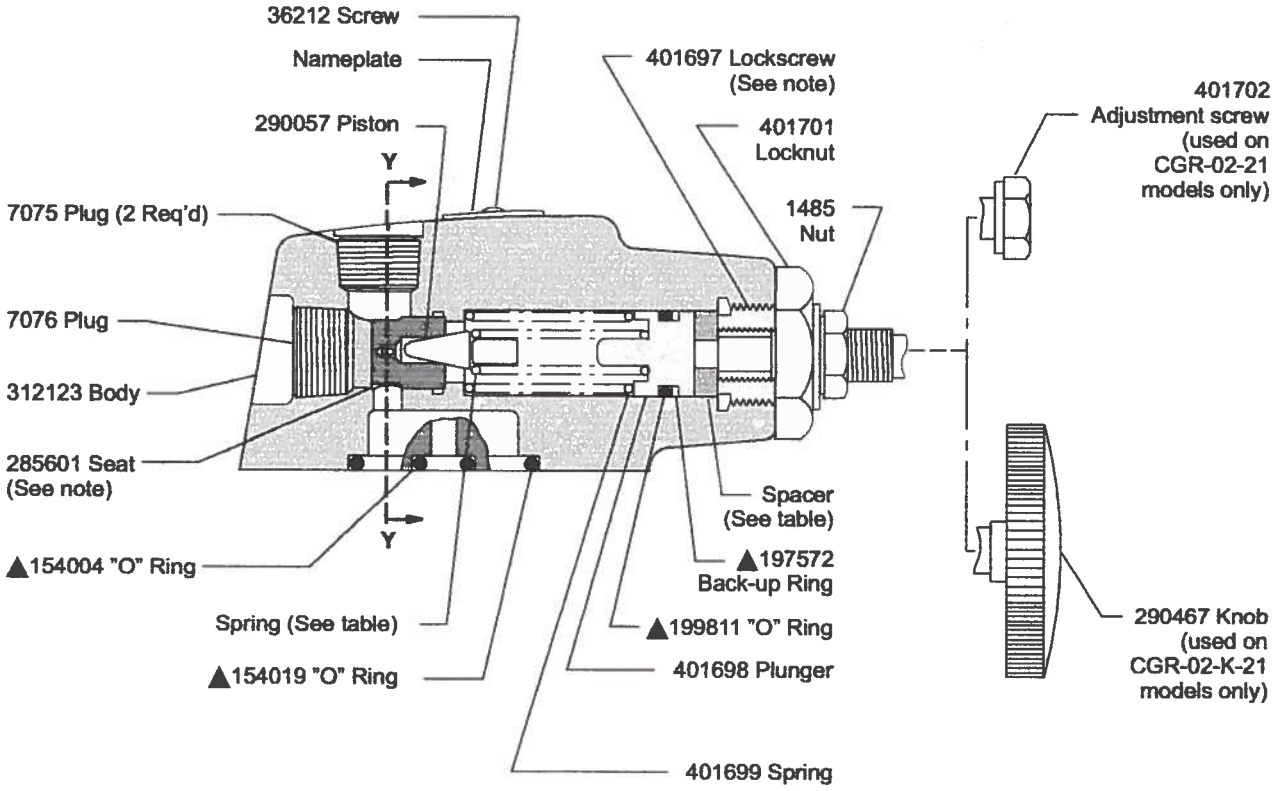
Service Data

Vickers®

Relief Valves

Remote Control Relief Valve

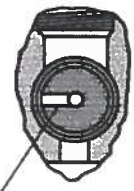
CGR-02-*-(K)-21



STD/F3 Seal Kit Cross Reference	
▲ STD 919853	F3 919854
154004	262330
154019	262394
197572	197572
199811	262334

NOTE: Assemble lockscrew with stepped outside diameter end toward spacer.

NOTE: Assemble 285601 seat with cross hole in position shown or 180° from position shown.



Y–Y

Model	Max. Adj. Pressure	Spring	Spacer
CGR-02-B-(K)-21	1000 PSI	2280	—
CGR-02-C-(K)-21	2000 PSI	583937	
CGR-02-F-(K)-21	3000 PSI	401700	386715

VICKERS

Model Code

CG R - 02 - * - (K) - 21

1 2 3 4 5 6

1 Model Series

CG - 0-3000 PSI Gasket mounted relief valve

2 Type

Remote control

3 Size

1/4 inch

4 Maximum Adjustment Pressure

B - 1000 PSI
C - 2000 PSI
F - 3000 PSI

5 Knob

K - Optional
Omit for hex head adjustment screw

6 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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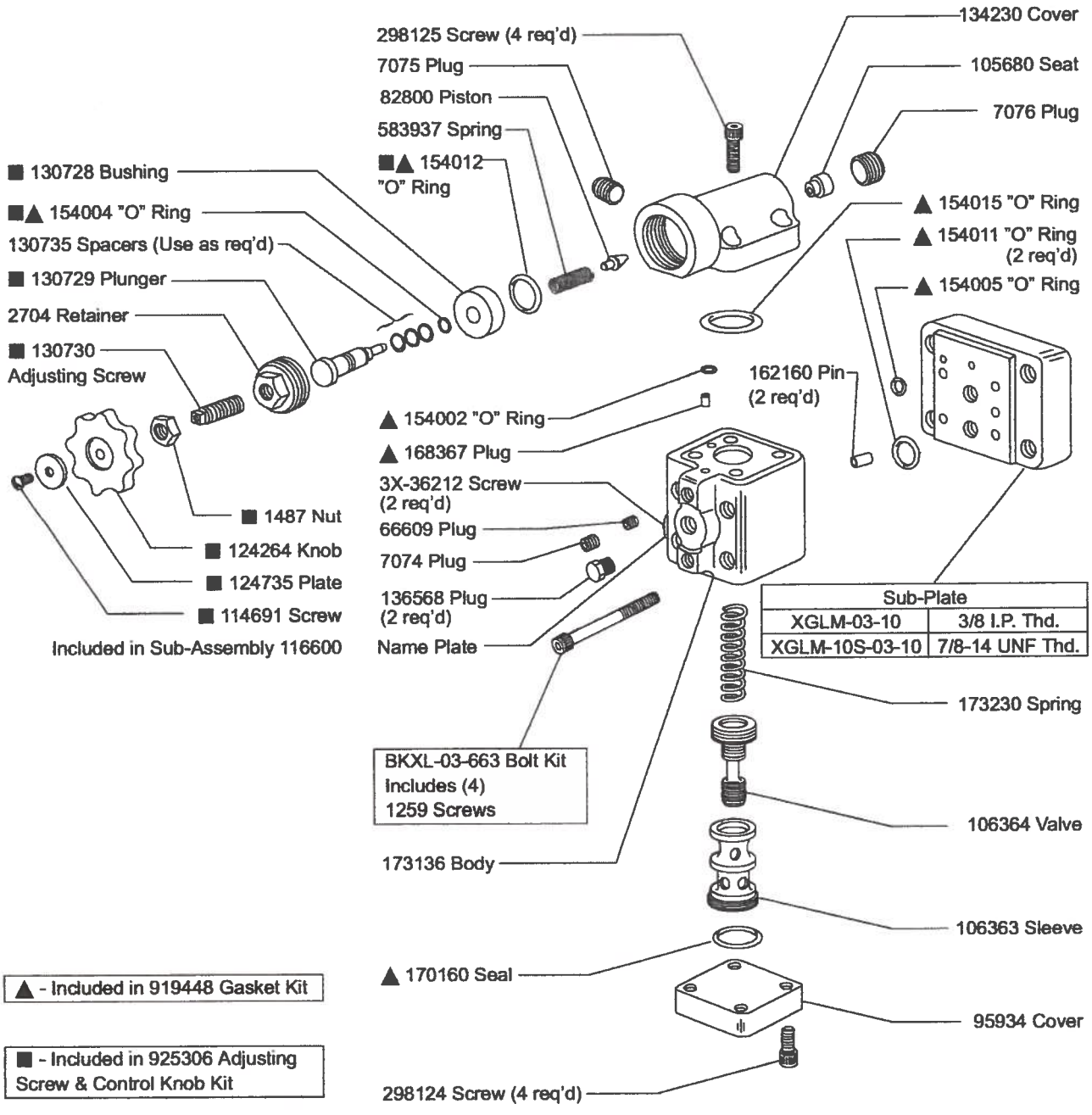
Service Data

Vickers®

Pressure Relief

Pressure Reducing Valves

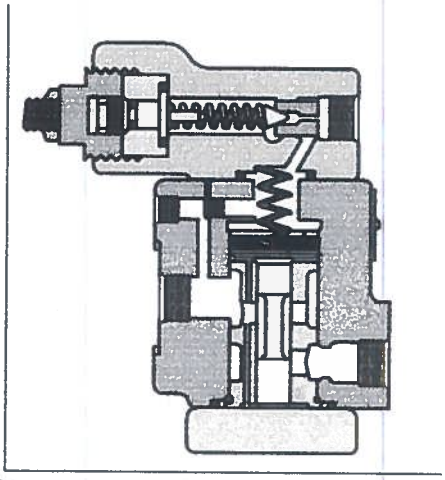
XGL-03-B-10
XSL-03-B-10
XTL-03-B-10



▲ - Included in 919448 Gasket Kit

■ - Included in 925306 Adjusting Screw & Control Knob Kit

XTL-03-B-10 Nominal Pipe Thread – 3/8"
XSL-03-B-10 14 SAE Straight Thread – 7/8"



Model	Plug	Seal	Cover	Screw (4 req'd)
XTL-03	16127	———	134230	298125
XSL-03	191362	▲154128	191363	

82800 Piston
583937 Spring
■▲ 154012 "O" Ring
■ 130728 Bushing
■▲ 154004 "O" Ring
130735 Spacers (Use as req'd)
■ 130729 Plunger
2704 Retainer
■ 130730 Adjusting Screw

■ 1487 Nut
■ 124264 Knob
■ 124735 Plate
■ 114691 Screw
Included in Sub-Assembly 116600

7076 Plug
105680 Seat
▲ 154015 "O" Ring
▲ 154002 "O" Ring
▲ 168367 Plug
3X-36212 Screw (2 req'd)
Name Plate

7075 Plug (2 req'd)
66609 Plug
7074 Plug

Model	Body
XTL-03	186664
XSL-03	173167

173230 Spring
106364 Valve
106363 Sleeve
▲ 170160 Seal
95934 Cover
298124 Screw (4 req'd)

▲ - Included in 919448 Gasket Kit

■ - Included in 925306 Adjusting Screw & Control Knob Kit

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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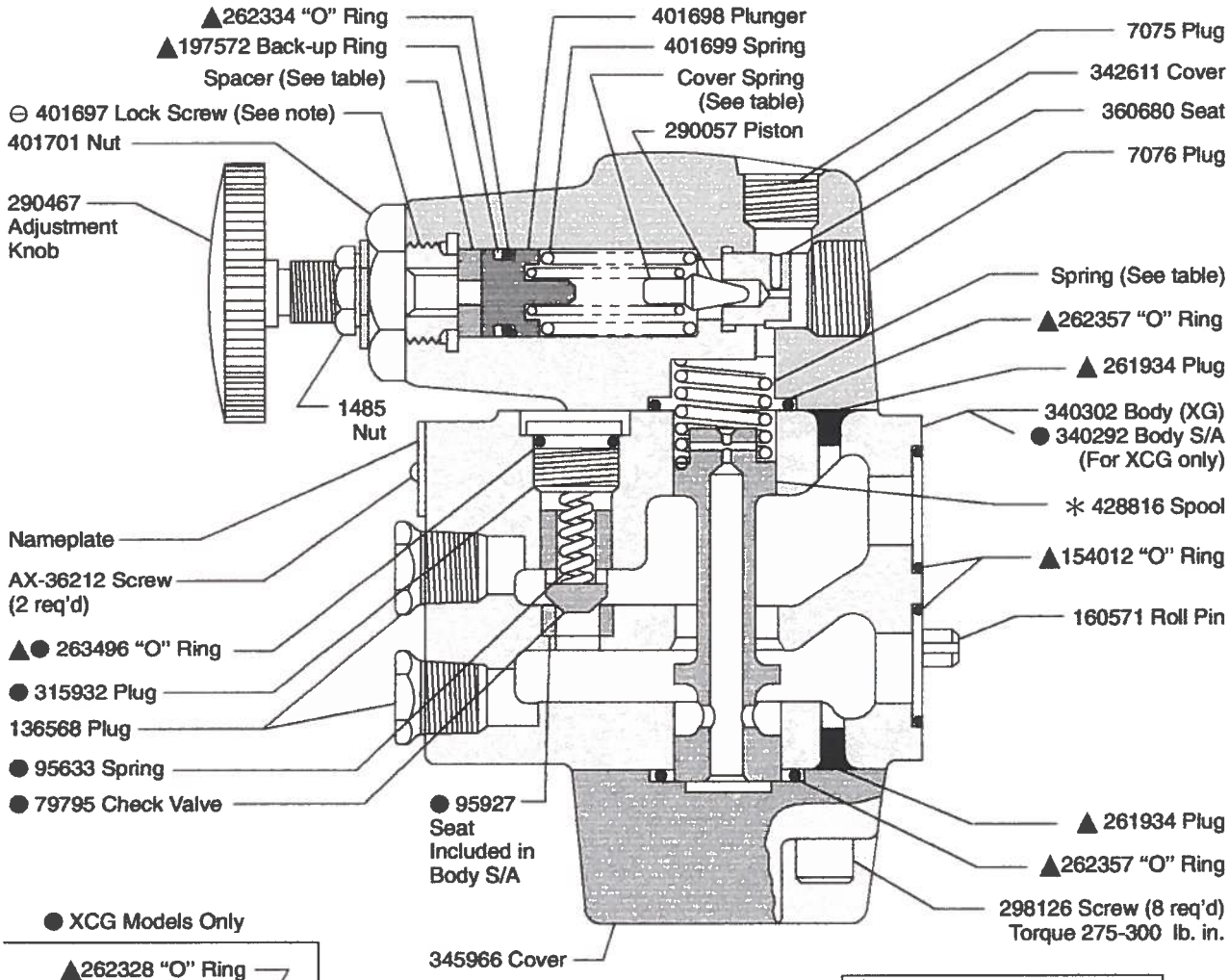
Service Data

Vickers®

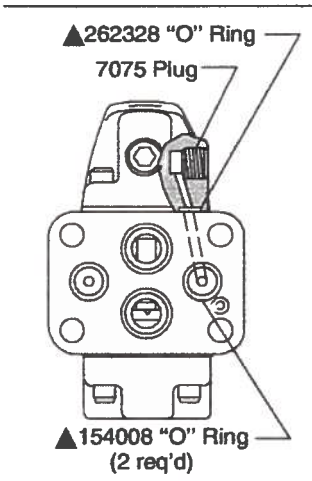
Pressure Relief

Pressure Reducing Valves

(F3)X(C)T-03--21/22**
(F3)X(C)G-03--21/22**



● XCG Models Only



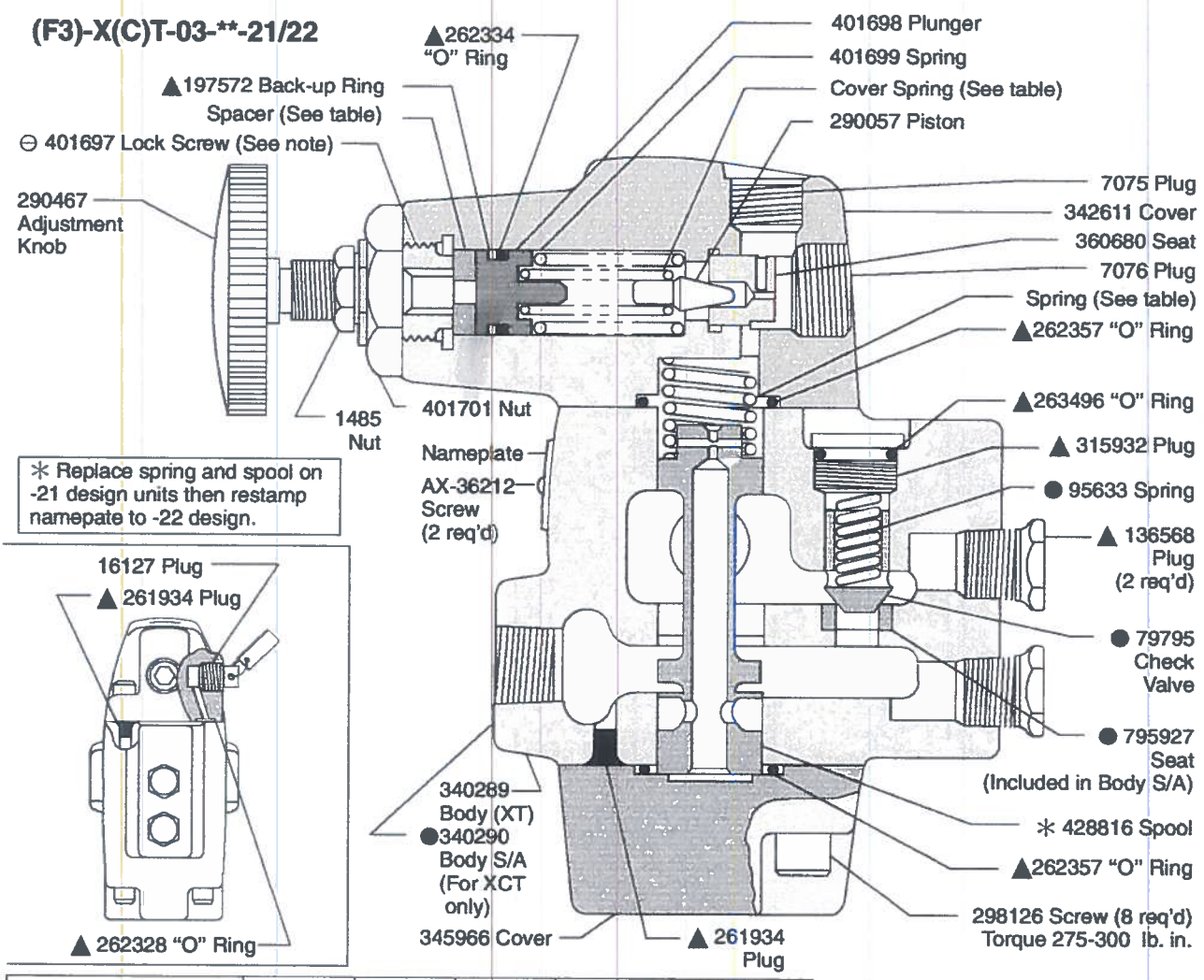
⊖ Note
Install Lockscrew with stepped O.D. end toward Spacer or Spring Retainer as shown.

✳ Replace spring and spool on -21 Design Units then restamp Nameplate to -22 Design.

▲Service all units with F3 Seal Kit 919836

Model	✳ Spring	Cover Spring	Spacer	Pressure Range PSI	Rated Flow USGPM
X(C)G-03-1B-21/22	428817	2280	—	75-1000	7
X(C)G-03-1F-21/22	428818			150-1000	14
X(C)G-03-2B-21/22	428817	583937		75-2000	7
X(C)G-03-2F-21/22	428818			150-2000	14
X(C)G-03-3F-21/22		401700	386715	150-2850	

(F3)-X(C)T-03-**-21/22



✳ Replace spring and spool on -21 design units then restamp namepate to -22 design.

Model	✳ Spring	Cover Spring	Spacer	Pressure Range PSI	Rated Flow USGPM
X(C)T-03-1B-21/22	428817	2280	—	75-1000	7
X(C)T-03-1F-21/22	428818			150-1000	14
X(C)T-03-2B-21/22	428817	583937		75-2000	7
X(C)T-03-2F-21/22	428818			150-2000	14
X(C)T-03-3F-21/22		401700	386715	150-2850	

▲Service all units with F3 Seal Kit 919836

⊖ Note
Install Lockscrew with stepped O.D. end toward Spacer or Spring Retainer as shown.

(F3) - X(C) * - 03 - * * - *2

[1] [2] [3] [4] [5] [6] [7]

[1] Seal Material
F3 - Seals for mineral oil and fire resistant fluids

[2] Model Series
XC - Pressure reducing check valve

[3] Mounting
G - Manifold or subplate
T - 3/8 in. NPTF thread

[4] Valve Size
03 - 3/8 inch

[5] Maximum Adjustable Pressure
1 - 1000 PSI
2 - 2000 PSI
3 - 2850 PSI (150 PSI minimum recommended)

[6] Maximum Rated USGPM Flow Capacity
B - 7 USGPM 75 min. adj. press.
F - 14 USGPM 150 min. adj. press.

[7] Design
21/-22

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

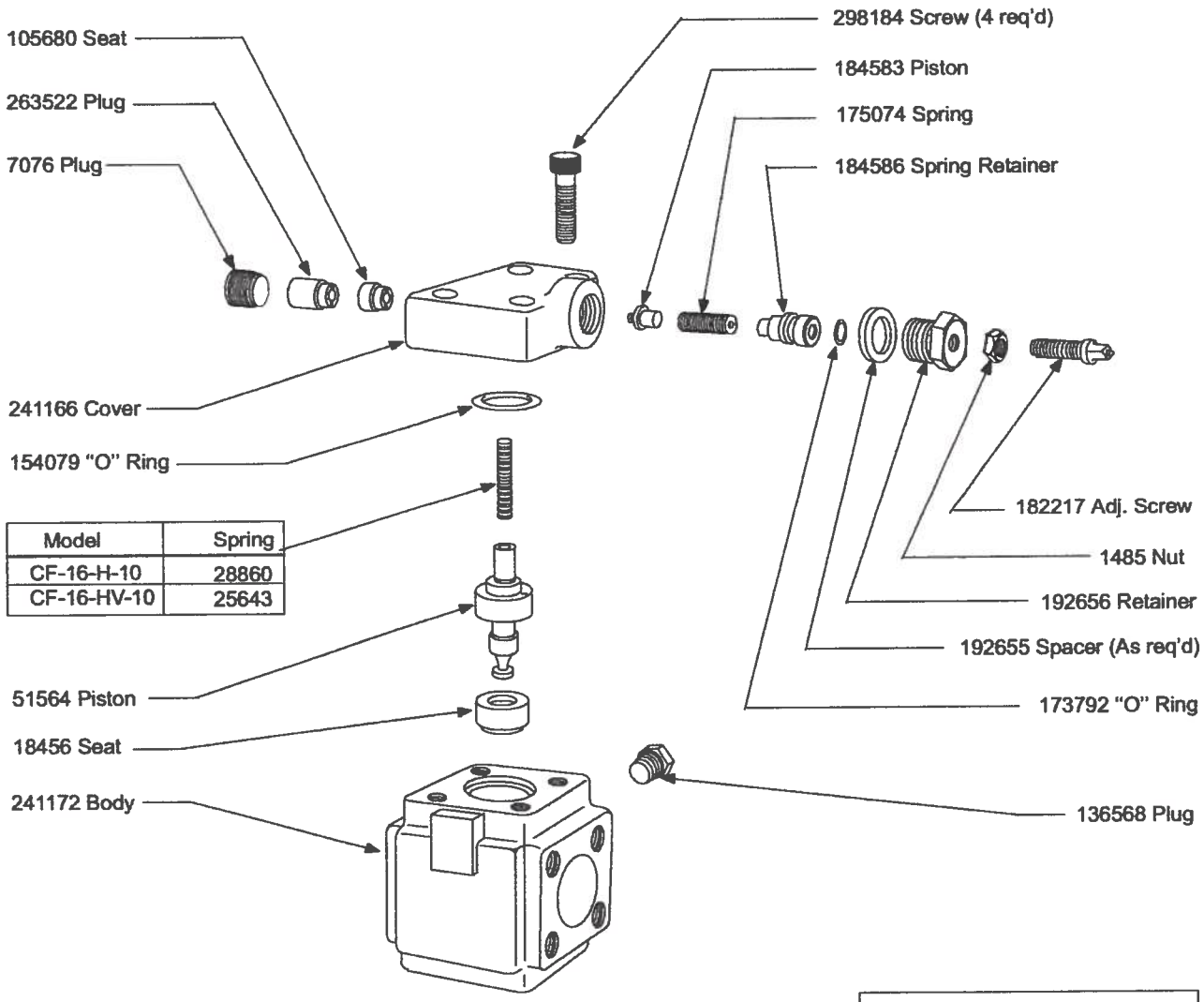
Vickers®

Valves

EATON

Relief Valve

CF-16-H(V)-10



Model	Spring
CF-16-H-10	28860
CF-16-HV-10	25643

NOTE
For information on connecting flanges, refer to Drawing I-3962-S.

VICKERS

Model Code

(F3) CF - 16 - H (V) - 10

1 2 3 4 5 6

1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a registered trademark of E.I. DuPont

2 Model Series

CF - Relief Valve, flange connections

3 Nominal Valve Size

16 - 2 inch

4 Pressure Range

H - 5000 psi

5 Spring

V - High vent
(Omit if not required)

6 Design Number

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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Overhaul Manual

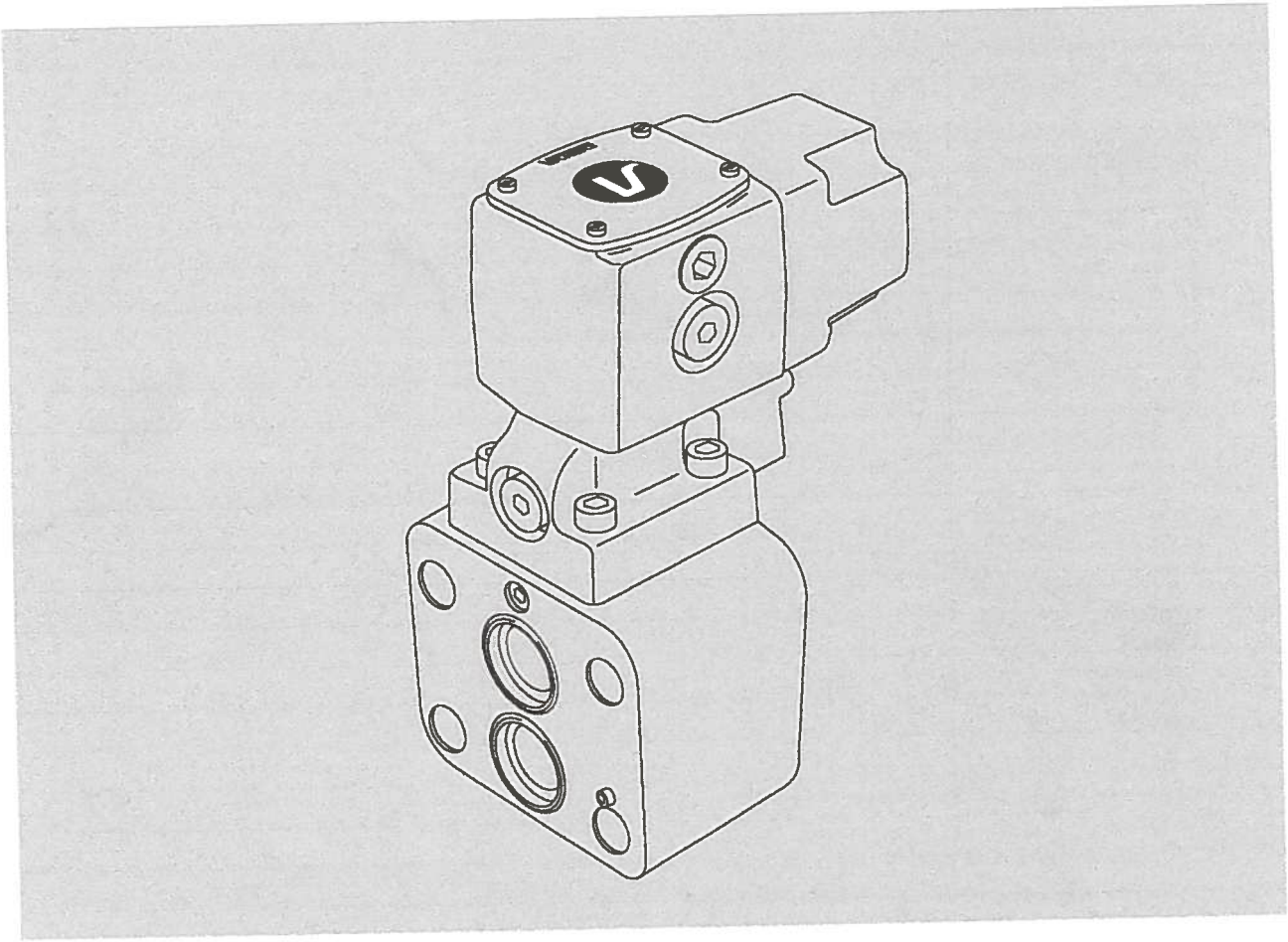
Vickers®

Pressure Controls

EATON

Electrically Modulated Relief Valve

(F3)-CGE-06-3(V)-2* (S*)
(F3)-CGE-10-3(V)-2* (S*)



VICKERS

Revised 10/1/87

I-3363-S

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Section I – Introduction

A. Purpose Of Manual

This manual describes the basic operational characteristics and provides service, overhaul and parts information for the Vickers CGE-06/10-*-2*-(S*) Remote Electrically Modulated Relief Valves.

The information contained herein pertains to the latest design series as listed in Table 1.

B. General Information

1. **Related Publications** – Service parts information and installation dimensions are not contained in this manual. The parts and installation drawings listed inTable 2 is available from any Vickers application engineering office.

Model Series	Parts Drawing	Installation Drawing
CGE-06-*-22-(S*) CGE-10-*-22-(S*)	I-3695-S I-3696-S	511040 511040

Table 1.

C. Model Code Breakdown

Variations within each basic model series are covered in the model code. Table 2 is a complete breakdown of the code covering these units. Service inquiries should always include the complete unit model code number as stamped on the nameplate.

Model Code

(F3) - C G E - ** - 3 (V) - 22 (S*)

1 2 3 4 5 6 7 8 9

1 Seals for mineral oil and fire resistant fluids

2 Relief valve

3 Subplate mounted

4 Remote electrically modulated

5 Valve size
06 - 60 Series (3/4" nom.)
10 - 100 Series (1/14" nom.)

6 Pressure rating (PSI maximum)
1 - 1000 (70 bar)
3 - 3000 (210 bar)

7 "V" - Optional high venting feature. Omit if not required. (For 3000 PSI (210 bar) pressure models only)

8 Design

9 S6 - External 35 Micron pilot filter (furnished by customer)
S7 - Viton seals with 35 Micron filter (early models)
S8 - Viton seals only (early models)

Table 1. Model Code Breakdown

Section II – Description

A. General

Assembly of a typical remote electrically modulated relief valve is shown in Figure 1. In general, the valve consists of three basic parts, a main stage, an intermediate body and the electricly modulated pilot. The main stage is similar to the stand relief valve. The intermediate body contains standard relief valve pilot parts to provide manual adjustment and has a mounting pad which accepts CETOP 3 components. The electrically modulated pilot is machined to fit the CETOP 3 pad and contains a flapper valve assembly, a blocking valve, and a ball type check valve.

B. Application

The new valve series provides a self-contained unit that modulates system pressure electrically over a wide range without external feedback devices.

The valve has the ability to control system pressure from any distance or location. Modulating signals may be derived from potentiometers, analog computers, power supplies or any other source that will provide the necessary drive current for the pilot stage. A current of 0-500 milliamperes (mA) is required to modulate the valve.

Power supply EMCS-*-30 was specifically designed for control of this type valve. The EMCS is not limited to potentiometer command only but can easily be adapted to remote control devices. For information on EMCS, refer to installation drawing 521557, from Technical Publications, Troy, MI 48084.

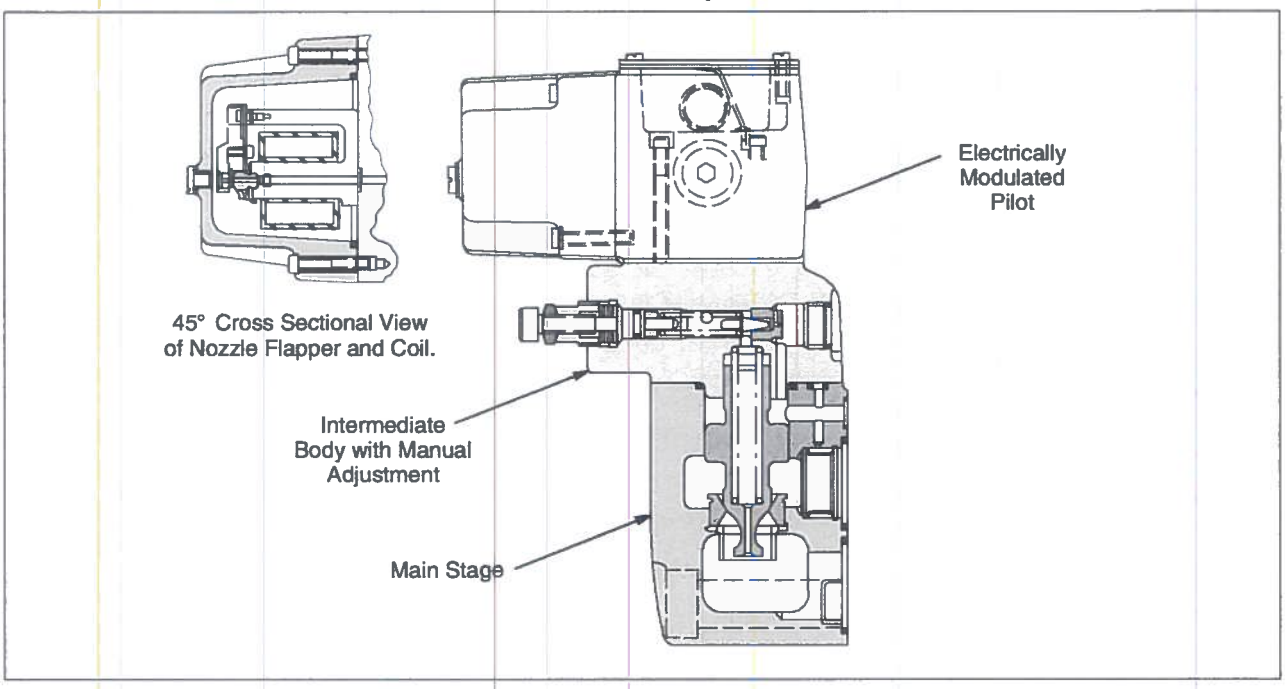


Figure 1. Remote Electrically Modulated Relief Valve Assembly.

Section III – Principles of Operation

A. Electrically Modulated Pilot

1. **Flapper, Nozzle and Coil:** The flapper nozzle is analogous to a poppet/seat with a spring type of control in that it is a force balance system. When current is applied to the coil, the resultant magnetic force pulls the flapper toward the pole piece. This results in a smaller hydraulic gap (orifce) and a build up of pressure at the upstream side of the valve. This increasing pressure produces a force which opposes the magnetic force and a balance is achieved with pressure being approximately proportional to current. Refer to Figure 2.

2. **Dual Gap Concept:**The hydraulic and magnetic gaps are both adjustable. This allows optimum trim of both gaps with a resulting improvement in stability and contamination tolerance.

3. **Dampening Shim:** The dampening shim prevents flapper oscillations. It is not used in 3000 PSI models.

4. **Blocking Valve:** The blocking valve is used to shut off flow to the flapper nozzle. This allows complete manual control during machine flushing and at start-up. To close the valve, shut down the machine and relieve all pressure. Remove the blocking valve access plug from the side of the pilot valve body. Remove and reverse the button. When the access plug is reinstalled, the spool shifts and flow is blocked to the nozzle.

5. **Drain Connection**

CAUTION

The pilot valve drain connection must be piped directly to the reservoir and terminate below the oil surface. A 0.5625-18, UNF-2B straight thread port, (for 3/8" tubing), is provided on the side of the pilot valve for this purpose.

6. **Secondary Filter Screen:** A 100 micron screen located close to the nozzle helps prevent plugging of the flapper orifice. To change or clean this screen, remove the blocking valve spool. The screen is located in the end of the spool. See Figure 2.

7. **Ball Check Valve:** A ball check valve is used to keep the pilot valve cover full of oil during shut down. See Figure 2.

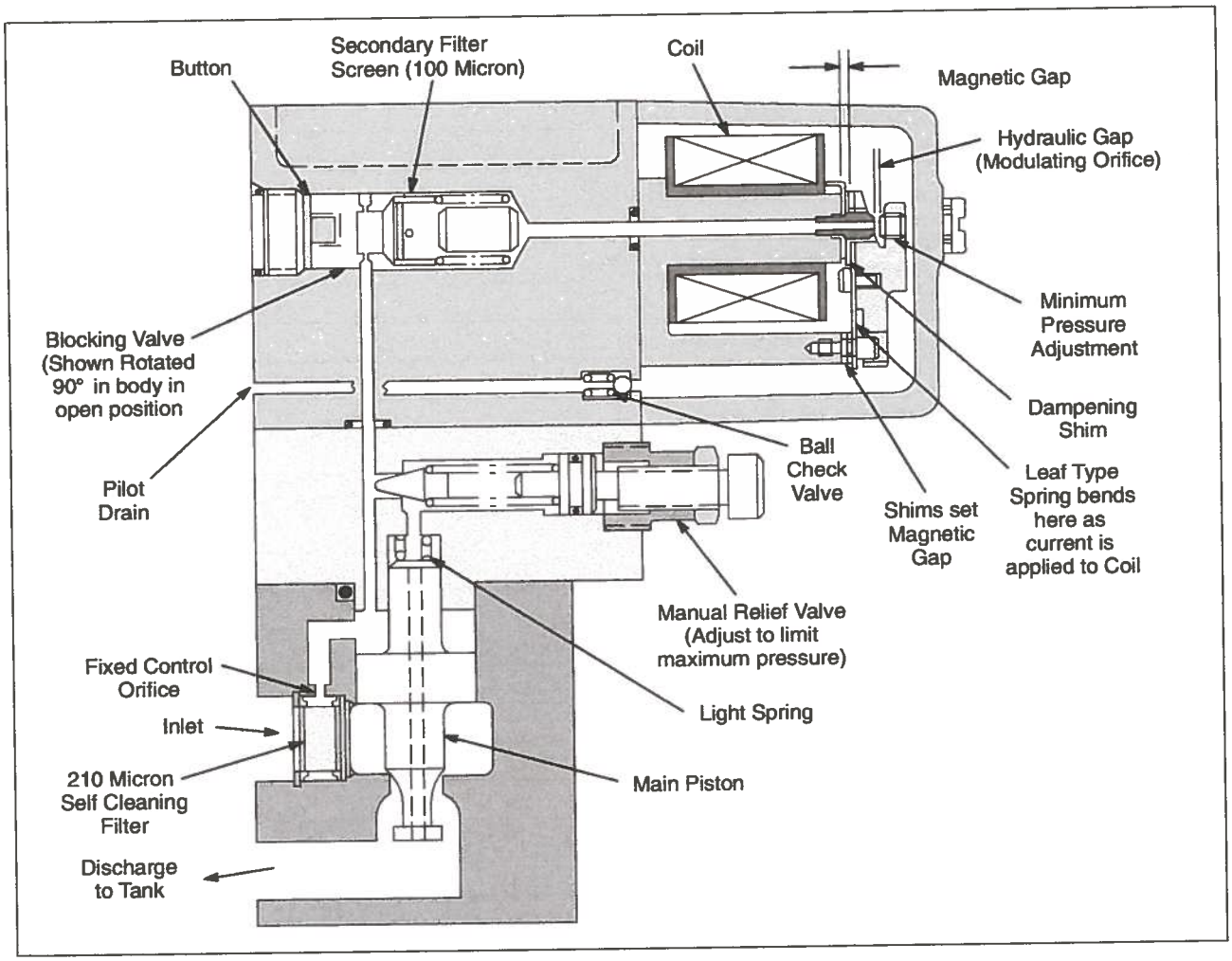


Figure 2. Complete Electrically Modulated Relief Valve Functional Diagram.

B. Intermediate Body

The intermediate body adapts the relief valve main stage to the electrically modulated pilot valve. A poppet and spring arrangement located in the intermediate body provides manual adjustment of relief pressure when the pilot valve is blocked. Normal operating procedure is to the adjust the manual relief above the maximum pressure excursion of the electrically modulated pilot stage. This prevents interaction of the poppet and flapper and provides a manually adjusted upper limit for the valve.

C. Main Stage

The main stage consists of a body, piston, spring(s), primary filter screen, and seat. A control orifice is drilled in the body instead of the piston. The primary filter screen (210 micron self cleaning type) protects the drilled orifice and pilot stage from contaminants.

D. Theory of Operation

NOTE

Refer to Figure 2 during the following discussion.

When a new CGE valve is installed into a system and the system energized; oil will flow into the inlet of the CGE valve.

The light spring holds the main piston closed against the seat until pressure below the piston builds up to about 80 PSI. The 80 PSI pressure differential lifts the piston porting oil to the reservoir. Also, the 80 PSI will cause oil to flow through the self cleaning filter screen and the control orifice, filling the open area above the piston and the valve body passages. When the body passage to the flapper nozzle is filled, the orifice developed by the flapper nozzle develops a back pressure at the top of the piston and increases the original 80 PSI to approximately 150 PSI. The oil will continue to flow throug the orifices filling the pilot cover. Pressure builds up within the cover, lifts the 5 PSI ball check from its seat and oil flows past the check into the pilot drain. The valve may be unstable until air is displaced within the pilot cover. With a new valve this displacement of air should be accomplished within one or two minutes.

The following action will take place when coil current is increased.

1. The increased current strengthens the magnetic field and attracts the flapper with a greater force toward the nozzle.

2. The modulating orifice decreases in size increasing the pressure at the upstream side of the orifice. This increase in pressure is reflected back to the top of the spool and adds to the light spring force. A higher pressure is then required at the inlet port to lift the spool.

NOTE

It can be seen from the preceeding discussion that the greater the coil current the higher the pressure developed by the valve. This condition must not be allowed to exceed the ratings of the valve. As a safety precaution, the manual adjust section of the valve can be set to this limit. Also, the electrical circuitry should be trimmed to limit the maximum pressure, (usually 500 milliamperes or less.)

Section IV – Installation and Operating Instructions

A. Installation Drawings

Installation dimensions are not contained in this manual. Refer to installation drawing 511040 for that information.

B. Mounting

No mounting restrictions exist. The valve may be oriented in either a horizontal or vertical position.

C. Piping and Tubing

1. All pipes and tubing must be thoroughly cleaned before installation. Recommended methods of cleaning are sandblasting, wire brushing and pickling.

NOTE

For instructions on pickling, refer to instruction sheet 1221-S.

2. To minimize flow resistance and possibility of leakage, only as many fittings and connections as are necessary for proper installation should be used.

3. The number of bends in tubing should be kept to a minimum to prevent excessive turbulence and friction of oil flow. Tubing must not be bent too sharply. The recommended radius for bends is three times the inside diameter fo the tube.

D. Hydraulic Fluid Recommendations

General Data

1. Oil in a hydraulic system performs the dual function of lubrication and transmission of power. It constitutes a vital factor in hydraulic system, and careful selection of it should be made with the assistance of a reputable supplier. Proper selection of oil assures satisfactory life and operation of system components.

2. Data sheet I-286-S for oil selection is available from Technical Publications, Troy, MI.

3. Oil recommendations noted in the data sheet is based on our experience in industry as a hydraulic component manufacturer.

4. Where special considerations indicated a need to depart form the recommended oils or operating conditions, see your Eaton representative.

E. Cleanliness

Thorough precautions should always be observed to insure the hydraulic system is clean:

1. Clean (flush) entire new system to remove paint, metal chips, welding shot, etc.

2. Filter each change of oil to prevent introduction of contaminants into the system.

3. Provide continous oil filtration to remove sludge and products of wear and corrosion generated during the life of the system.

4. Provide continuous protection of system from entry of airborne contamination, by sealing the system and/or by proper filtration of the air.

5. During usage, proper oil filling and servicing of filters, breathers, reservoirs, etc., cannot be over emphasized.

6. Thorough precautions should be taken, by proper system and reservoir design, to insure that aeration of the oil will be kep to a minimum.

F. Sound Level

Noise is only indirectly affected by the fluid selection, but the condition of the fluid is of paramount importance in obtaining optimum reduction of system sound levels.

Some of the major factors affecting the fluid conditions that cause the loudest noises in a hydraulic system are:

1. Very high viscosities at start-up temperatures can cause pump noises due to cavitation.

2. Running with a moderately high viscosity fluid will impede the release of entrained air. The fluid will not be completely purged of such air in the time it remains in the reservoir before recycling through the system.

3. Aerated fluid can be caused by ingestion of air through the pipe joints of inlet lines, cylinder rod packings, or by fluid discharging above the fluid level in the reservoir. Air in the fluid causes a noise similar to cavitation.

Section V – Service, Inspection, and Maintenance

A. Service Tools

1. One each of the following hollow set screw hex keys: metric, 2.5mm, 3mm, and 4mm - inch, 3/16, 5/16, 1/4, 1/2, and 5/8.

2. Torque wrench with adapters for above stright hex keys.

3. Internal Truarc pliers (2300).

4. Small adjustable (6") wrench.

5. Feeler gage set (inch or metric).

6. Arbor press.

B. Special Tools

No special tools are required for the maintenance of the valve.

C. Inspection

Periodic inspection of the fluid conditions and the tube or piping connections can save time-consuming breakdowns and unnecessary parts replacement. The following should be checked regularly:

1. All hydraulic connections must be kept tight. A loose connection in a pressure line will permit the fluid to leak out. If the fluid level becomes so low as to uncover the inlet pipe opening in the reservoir, extensive damage to the pump can result. In suction or return lines, loose connections permit air to be drawn into the system resulting in noisy and/or erratic operation.

2. Clean fluid is the best insurance for long service life. Therefore, the reservoir should be checked periodically for dirt or other contaminants. If the fluid becomes contaminated, the system should be drained and the reservoir cleaned before new fluid is added.

3. Filter elements also should be checked and replaced periodically. A clogged filter element results in a higher pressure drop. This can force particles through the filter which would ordinarily be trapped, or can cause the by-pass to open, resulting in a partial or complete loss of filtration.

4. Air bubbles in the reservoir can ruin circuit components. If bubbles are seen, located the source of the air and seal the leak. (See table 3).

D. Adding Fluid to the System

When hydraulic fluid is added to replenish the system, it should always be poured through a fine wire screen (200 mesh or finer) or preferably pumped through a 10 micron (absolute) filter.

It is important that the fluid be clean and free of any substance which could cause improper operation. Therefore, the use of cloth to strain the fluid should be avoided to prevent lint getting into the system.

E. Adjustments

No periodic adjustments are required.

F. Lubrication

Internal lubrication is provided by the fluid in the system.

G. Replacement Parts

Reliable operation throughout the specified operating range is assured only if genuine Vickers parts are used. Sophisticated design processes and material are used in the manufacture of our parts. Substitutions may result in early failure. Part numbers are shown in the parts drawings listed in Table 2.

H. Troubleshooting

Table 3, lists the common difficulties experienced with relief valves. It also indicates probable causes and remedies for each of the troubles listed.

Troubleshooting Chart

	Probable Cause	Remedy
No load pressure or low pressure. Trouble	1. Manual relief improperly adjusted.	Adjust manual relief valve to proper setting.
	2. Open vent connection.	Plug vent opening.
	3. Poppet not properly seated.	Back off adjusting screw several turns while running pump to clear any contamination between poppet and seat. Check poppet and seat for wear. Check spring.
	4. Self cleaning filter is plugged. (located in the pressure port).	Remove, clean and/or replace.
	5. Control orifice in body is plugged.	Remove filter screen and open orifice with a small wire. (orifice size is 0.040)
	6. No current to coil.	Check for loose electrical connection. Check output of power supply. Check resistance of coil. (resistance is 17 to 20 Ohms nominal).
	7. Piston sticking in the open position.	Remove piston. Check piston and bore for burrs. Use polishing paper or an Arkansas stone to remove burrs.
Maximum pressure (valve will not modulate).	1. Plugged flapper orifice.	Clean orifice and clean and/or replace internal filters.
	2. Secondary filter plugged.	Clean filter.
	3. Button reversed causing blocking valve to prevent flow to nozzle.	Remove and reverse button.
	4. Power supply current maximum.	Vary command control of power supply. If current does not change, repair or replace the power supply.
Erratic pressure.	1. Contamination.	Clean the system components, and flush the system.
	2. Piston sticking in body bore.	Remove piston. Check piston for burrs and freedom of movement in bore. Replace if necessary.
	3. Erratic input signal from power supply.	Check for loose electrical connections, broken wires, etc.
	4. Misalignment of cover and body causing piston to stick.	Loosen cover screws and check piston movement as described in reassembly section. Properly torque the cover screws.
Excessive noise or chatter.	1. High flow through valve.	Check valve flow rating. Replace with larger size valve if necessary.
	2. Excessive tank line pressure.	Connect tank line directly to reservoir.
	3. Vent line too long.	Add a restriction (needle valve or orifice), in the vent line next to the valve.
	4. Manual relief valve setting to close to system pressure.	Set manual relief higher than the maximum pressure setting of the electrically modulated valve.
	5. Dampening shim left out of the valve. (1000 PSI models only.)	Add shim to valve.
	6. Dither control located on power supply set to high.	Adjust dither control until a vibration is felt in the machine. Reduce the control setting until vibration just disappears.
	7. Power supply malfunction.	Check for loose connections, loose ground connection, broken wires, etc. Repair and/or replace.

Section VI – Overhaul

A. General

WARNING

Turn off all electrical power and relieve hydraulic pressure. Before breaking a circuit connection, make certain that power is off and system pressure has been released. Lower all vertical cylinders, discharge accumulators, and block any load whose movement could generate pressure.

B. Unit Removal

1. Remove the unit from the system.

2. Cap all system openings to prevent contamination.

CAUTION

Absolute cleanliness is essential when working on a hydraulic system. Always work in a clean area. The pressence of dirt and foreign materials in the system can result in serious damage or inadequate operation.

C. Disassembly

Periodic maintenance of the valve will generally not require disassembly to the extent described here. However, the sequence can also be used as a guide for partial disassembly. In general, disassembly is accomplished in the item number sequence shown in Figure 3. Special procedures are included in the following steps:

NOTE

Discard and replace all O-Rings and gaskets removed during disassembly.

1. Thoroughly clean the exterior of the valve.

2. The valve cover is full of fluid, so hold it over a container when cover (4), Figure 3 is removed.

NOTE

Refer to index numbers located on Figure 3 throughout the disassembly procedure.

3. Remove parts (1) through (11a) except do not remove adjustment screw (7) from flapper plate S/A (8) unless inspection of nozzle (12) mating surface shows erosion. See Figure 3.

4. Remove nozzle (12) with a 5 mm open end or a small adjustable wrench. Turn nozzle counter-clockwise to remove.

NOTE

Do not remove screw (18) or gasket S/A (17) in the following step unless gasket is damaged.

5. Remove parts (13) through (20). Pull coil (19) carefully from body (38), do not break wires. Part (13) does not exist on 3000 PSI models.

6. Remove parts (21) through (30). If spool (27) is tight, thread a 5/16-18, (M8-6H), screw into the spool end, work the spool in and out to loosen, then remove spool from body (38).

CAUTION

Do not clean filter screen (28) with a scribe or a pick.

7. Remove parts (31) through (36). If the check valve seat is tight within the body, a small hooked tool may be used to removethe check valve seat. Press the ball inward and hook the seat; work the seat out by pulling first one side then the other.

8. Remove parts (37) through (52). Do not remove seat (53) unless inspection of piston (50) reveals damage to the piston seating surface.

NOTE

Plunger (46) contains an 8-32 thread for disassembly purposes, (early designs use a 10-24 thread).

9. Remove parts (54) through (66). Use the internal Truarc pliers to remove retaining ring (62).

10. Remove parts (67) and (68). These parts exist on -S6 special models only.

NOTE

Do not remove rollpin (69) in the following step unless damaged. The mouting surface can be scored during removal. If removal is necessary, check surface for burrs and flatness before installation of a new rollpin.

11. Remove parts (69) through (71). Do not remove seat (70) unless piston (59) shows evidence of damage in the seat area.

NOTE

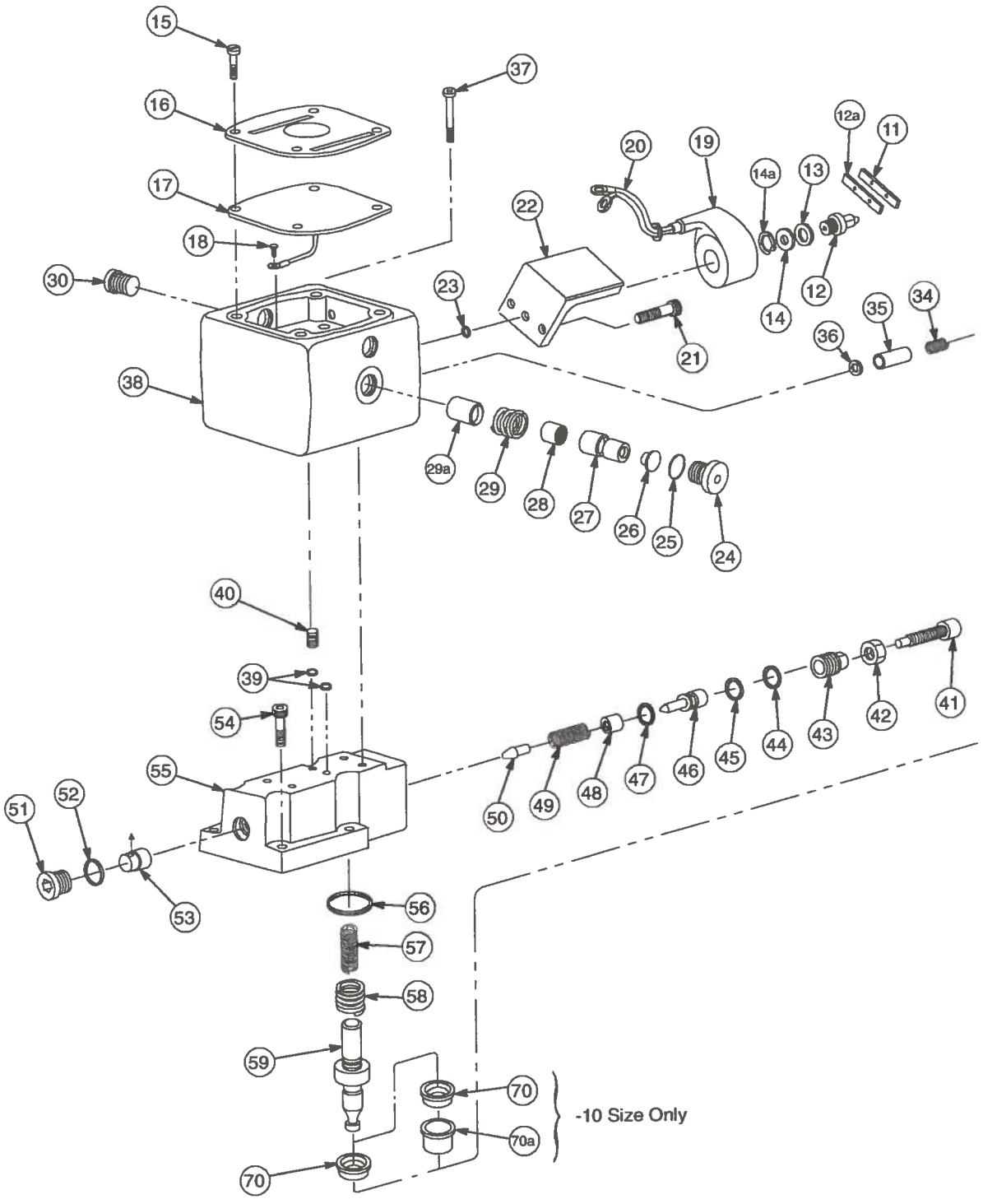
CGE-10-*-20 units use a sleeve (70a) located below seat (70). Refer to Figure 3. Replace the seat and sleeve if damaged.

D. Cleaning

All parts must be thoroughly cleaned and kept clean during inspection and assembly. The close tolerance of the valve makes this requirement more stringent than usual. Clean all removed parts, using commercial solvent that is compatible with the system fluid. Compressed air may be used in cleaning the valve, but it must be filtered to remove water and contamination. Clean compressed air is particularly useful in cleaning the spool orifices and body passages.

CAUTION

Do not stone edges of piston (59). See Figure 3.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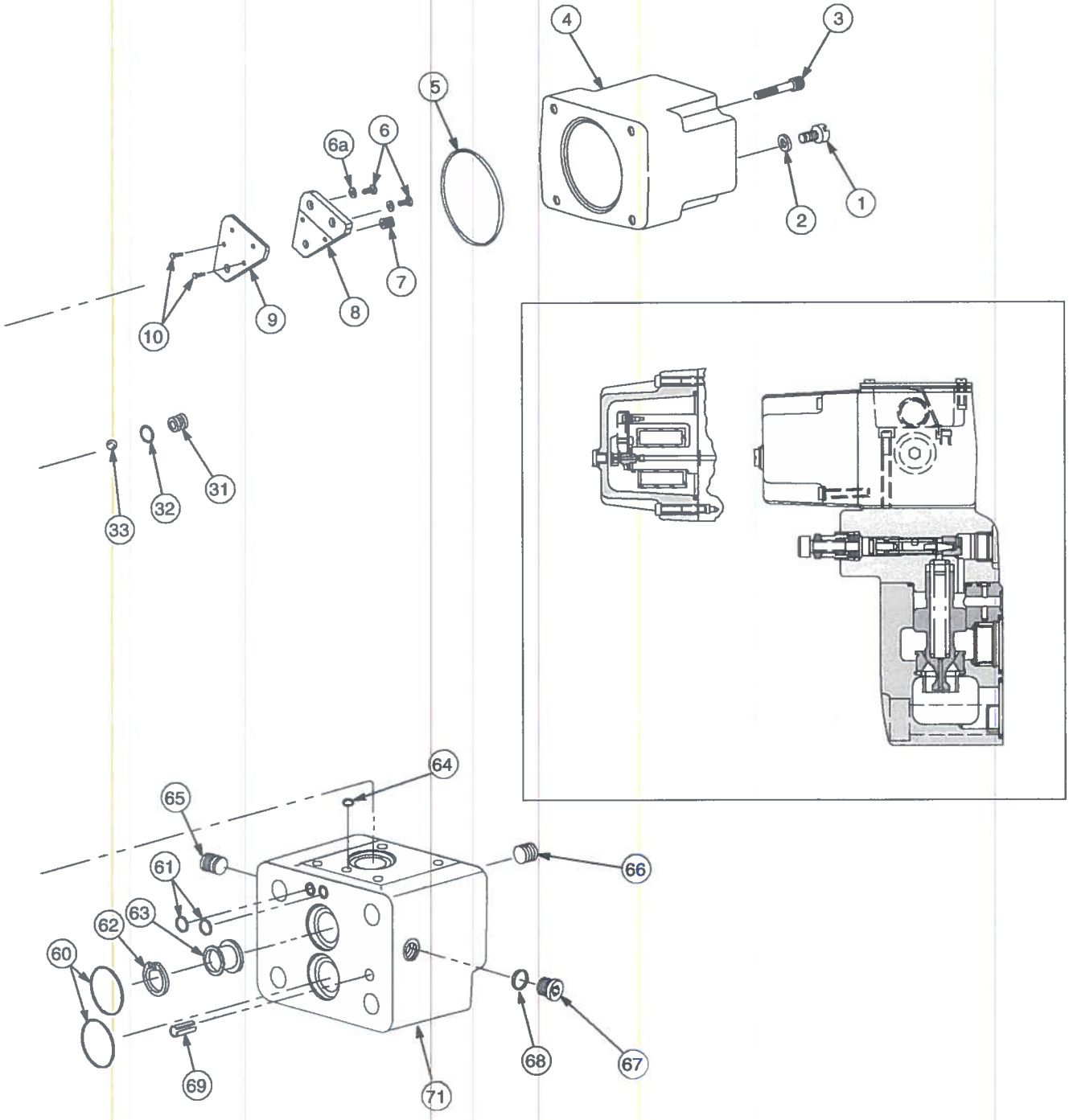
-10 Size Only

Figure 3.



Exploded View

Fig. & Index No.	Description	Units Per Assy.
1	Screw	1
2	Washer (Dyna Seal)	1
3	Screw	4
4	Cover	1
5	O-Ring	1
6	Screw	2
6A	Washer	2
7	Adjustment Screw	1
8	Flapper Plate S/A	1
9	Leaf Spring	1
10	Screw	2
11	Shims	A/R
11a	Shim	1
12	Nozzle	1
13	Dampening Shim	1
14	Coil Retainer	1
14a	Retaining Ring	1
15	Screw	4
16	Nameplate	1
17	Wire & Gasket S/A	1
18	Screw	1
19	Encapsulated Coil	1
20	O-Ring	1
21	Screw	2
22	Frame	1
23	O-Ring	1
24	Plug	1
25	O-Ring	1
26	Button	1
27	Spool (Blocking Valve)	1
28	Filter Screen	1
29	Spring	1
29A	Rod	1
30	Plug	1
31	Seat	1
32	O-Ring	1
33	Ball	1
34	Spring	1

Fig. & Index No.	Description	Units Per Assy.
35	Retainer	1
36	Washer	1
37	Screw	4
38	Body	1
39	O-Ring	2
40	Plug	1
41	Adjusting Screw	1
42	Nut	1
43	Lock Screw	1
44	Shim	A/R
45	Washer	1
46	Plunger	1
47	O-Ring	1
48	Spacer	1
49	Spring	1
50	Piston	1
51	Plug	1
52	O-Ring	1
53	Seat	1
54	Screw	4
55	Intermediate Body	1
56	O-Ring	1
57	Spring	1
58	Spring	1
59	Piston	1
60	O-Ring	2
61	O-Ring	2
62	Retaining Ring	1
63	Filter Screen	1
64	O-Ring	1
65	Plug	1
66	Plug	1
67	Plug	1
68	O-Ring	1
69	Roll-pin	1
70	Seat	1
70a	Sleeve	1
71	Body	1

E. Inspection, Repair, and Replacement

Check that all internal passages are clean and unobstructed. Examine all mating surfaces for nicks and burrs. Minor nicks and burrs. Minor nicks and burrs can be removed with an India stone, or crocus cloth. If unit has operated in a contaminated system, all internal passages of pilot body (38), intermediate body (55) and main stage body (71) must be thoroughly flushed with clean solvent.

NOTE

Refer to index numbers located on Figure 3 throughout the inspection, repair and replacement procedure.

1. Inspect all screws for evidence of damaged threads. If threads are damaged, replace the screws.

2. Inspect springs (29, 34, 49, 57 and 58) for damaged coils. Replace springs if coils are damaged. Inspect springs for distortion. The ends of the springs shall be square and parallel to each other. Replace spring if distorted.

3. Perform a continuity test on coil (19). Resistance valves should range from 17 to 19 Ohms. This test is superficial, a more rigorous test requires special equipment. Replace the part if threads are damaged. Inspect the orifice face of nozzle for evidence of nicks or scratches. If the orifice size is distorted, or face is eroded, replace the part.

4. Inspect nozzle (12) for damaged threadS. Replace the part if threads are damaged. Inspect the orifice face of nozzle for evidence of nicks or scratches. If the orifice size is distorted, or face is eroded. Replace the part.

NOTE

Two nozzle sizes are available:
1. 0.070 inch diameter hole for 1000 PSI models.
2. 0.058 inch diameter hole for 3000 PSI models.

5. Inspect mating surfaces of cover (4), frame (22), body (38), intermediate body (55), and body (71) for nicks and scratches. Remove nicks and scratches using an India stone and/or polishing paper.

NOTE

Use polishing paper on a clean flat surface.

6. If a new piston (59) is required, use a three (3) or four (4) cornered India stone to break the feather edge of balancing grooves. Use 500 grit polishing paper lightly on the outside diameter of the piston. Wash the piston in clean solvent.

7. If seat (70) was removed, make sure hole in body is clear.

8. Inspect spool (27), button (26), and filter screen (28). If spool is scratched across the lands, body (38) may have scratches within the bore. Check to ascertain damage and replace parts if scratches are such that binding of the spool occurs or leakage through the blocking valve is excessive. Minor scratches can be removed with 500 grit paper. Make certain filter screen is not ruptured or bent.

NOTE

If spool (27) shows indications of large particle contamination, replace filter screen (63).

9. Inspect adjustment screw (7) for erosion. If adjustment screw (7) is loose within flapper plate, repalce screw. Inspect threads; screws (10) should thread easily into the flapper plate.

10. Inspect leaf spring (9) for burrs and possible fracture. Leaf spring should be flat. If a small bow exists, install the leaf spring against flapper plate (8) with bow outward. Screws (10) will pull the leaf spring flat against the flapper plate S/A. If bow is too great to be corrected, replace leaf spring (9).

11. Inspect the check valve assembly for burrs, and possible fracture.

12. Inspect pistion (59) to body (71) clearance as follows: Clean and lubricate piston and body. Insert piston into body bore and turn 360° while moving the piston in and out of the bore. If binding occurs, remove piston, stone the balancing grooves and use 500 grit paper lightly on the surface of the piston. Clean and lubricate piston (59) and perform the clearance test again. Piston (59) should fit the bore with no noticeable side play. Check the pistion's fit into intermediate body (55). Use the same procedure.

13. Make sure the 0.040 control orifice located in body (71) is open. The orifice is located below O-Ring (64) and is a straight through drilled hole.

F. Assembly

Replace the O-Rings removed from the unit with those supplied in the seal kit. Lubricated O-Rings and parts, using clean system fluid to facilitate assembly. Assembly of the parts will be in the reverse numberical sequence. Special procedures are included in the following steps:

NOTE

Refer to index numbers located on Figure 3 throughout the assembly procedure.

1. If seat (70), (70 and 70a on -10 size units), was removed from body (71), install a new seat by pressing fully into place against the shoulder. Use an arbor press for this operation.

2. If seat (53) was removed, install new seat (53) full in against the shoulder. Orient radial hole toward pilot stage see Figure 3. Use an arbor press to install seat (53).

3. If rollpin (69) was removed, make sure the mounting surface is flat before installation of a new rollpin.

4. Install plugs (67, 66, and 65) into body (71). Plug (67) exists on the -S6 models only. Use new O-Ring (68) on plug (67).

5. Install O-Ring (64), filter screen (63) and retaining ring (62) into body (71).

6. Install parts (59) through (54). Torque screws (54) hand tight, then use a hex key to move piston (59) within the valve (see Figure 4). Piston (59) should not stick or show evidence of bind. Cross torque screws (54) to 112 lbf. in., (12.6 N.m) maximum. Check the piston again to see if a bind occurs.

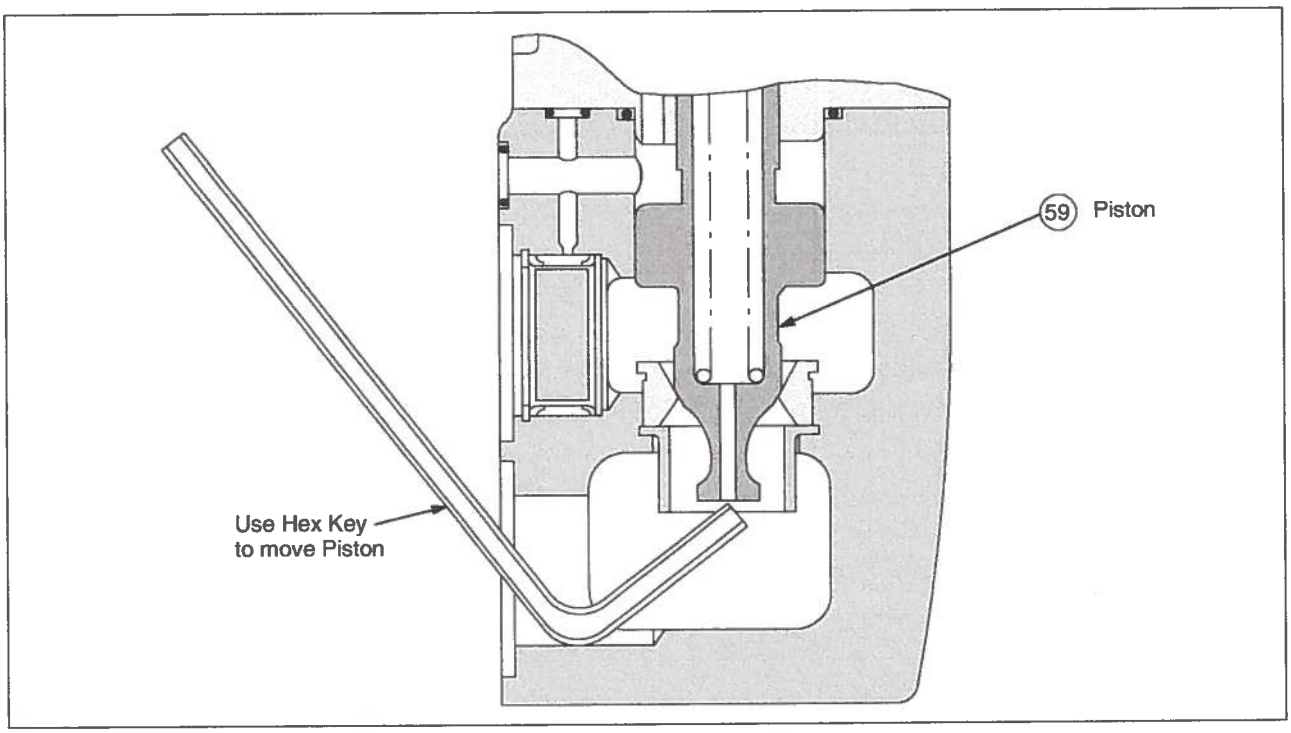


Figure 4. Check of main piston for bind.

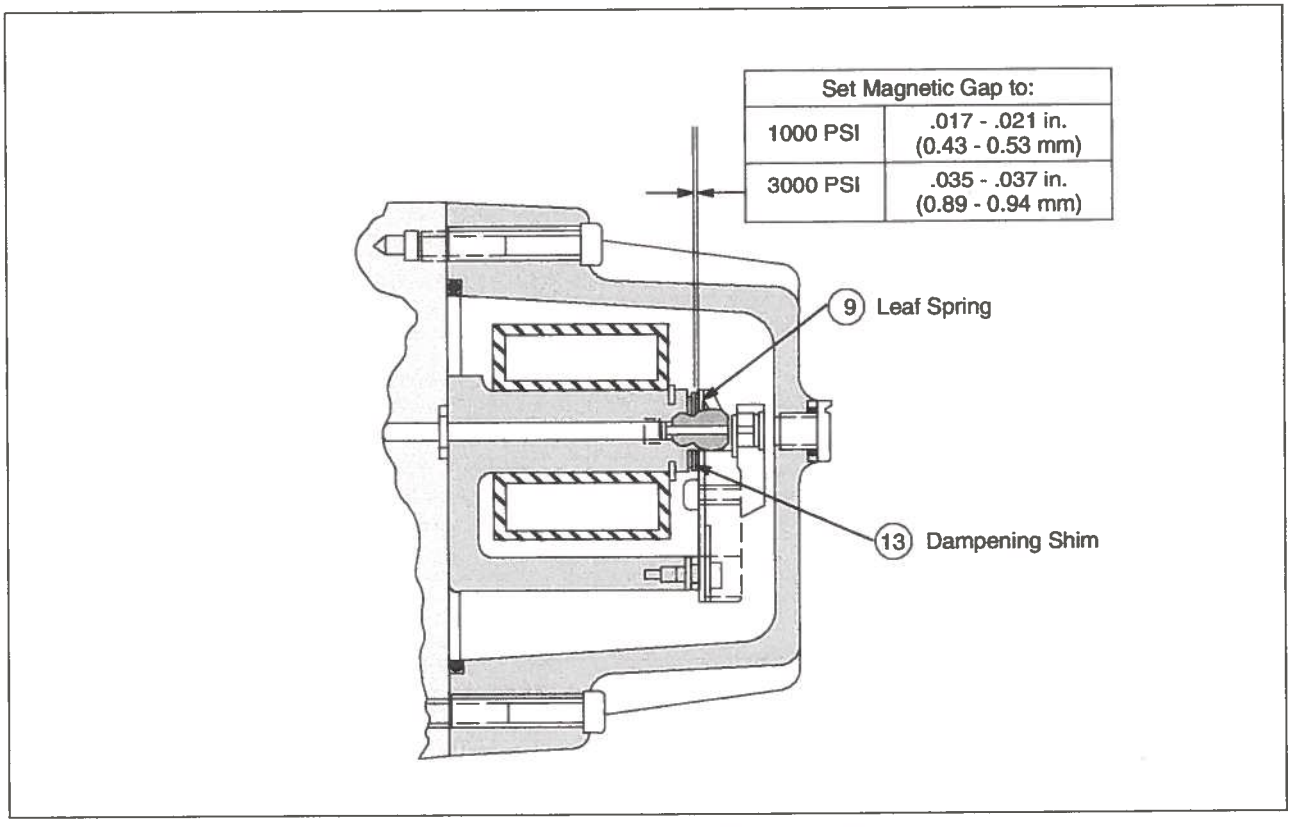


Figure 5. Setting magnetic gap on 1000 & 3000 PSI models.

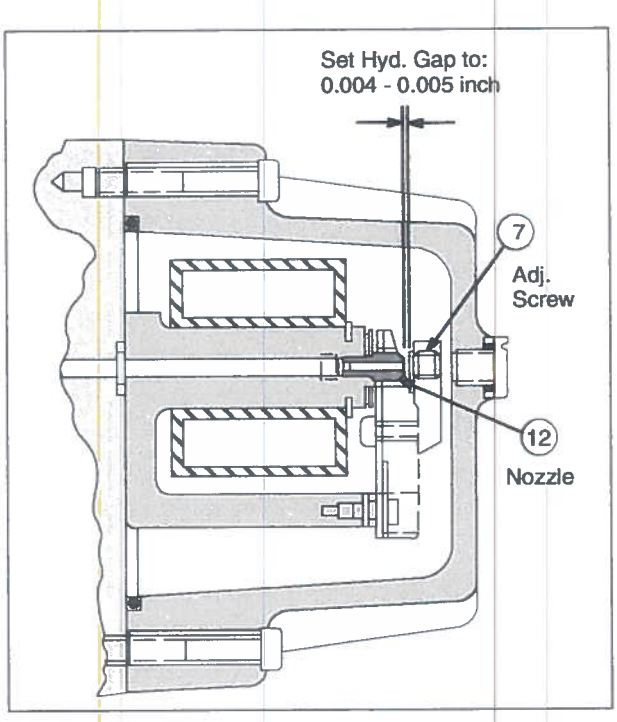


Figure 6. Setting hydraulic gap.

7. Install manual relief valve parts (52) through (41) into cover (55). If a new seat (53) was installed, coin piston (50) to seat (53). Use a six inch (6") piece of tubing to hold the piston. Insert piston and tubing into valve until piston rest against seat (53). Gently tap the tubing (while holding tubing centered int he bore); this mates the piston to the seat. REmove piston (50) and tubing, then remove piston from the tubing. Install parts associated with piston into valve, (49) through (41).

8. Install parts (40) through (37). Plug (40) must be below the mounting face of body (38) after installation. Cross torque screws (37) to 42 lb. in., (4.7 N.m), maximum.

9. Install check valve parts (36) through (31). If a new ball or seat is used, coin the ball and seat prior to installation.

10. Install plug (30) and blocking valve assembly parts (29a) through (24). Filter screen (28) fits into spool (27) with screen side inward. (Use petroleum jelly to retain filter screen within spool at assembly.) Important: Install button in manual position, (reversed from that shown in Figure 3). The blocking valve must prevent flow to the flapper orifice. (Initial test procedure set up).

11. Install parts (23) throug (21). Torque screws (21) to 40 lb. in., (4 - 4.5 N.m).

12. Install O-Ring (20) in place over coil (19) wires. Slide coil (19) over frame (22) while inserting wiresinto body (38) wiring cavity. Gently press O-Ring (20) and wires through body opening until coil bottoms against the screw heads (21) that secure frame (22).

13. Install parts (18) through (12). Dampening shim (13) exists on 1000 PSI models only. Thread nozzle (12) through coil retainer (14) into frame (22) Use a 5 mm open end wrench or a small adjustable wrench to tighten the nozzle. Do not overtighten the nozzle (12) or accidently strike the nozzle orifice face with the wrench. Damage to the orifice face could reduce the maximum pressure setting, (due to leakage past the orifice). See Figure 5 for location of dampening shim.

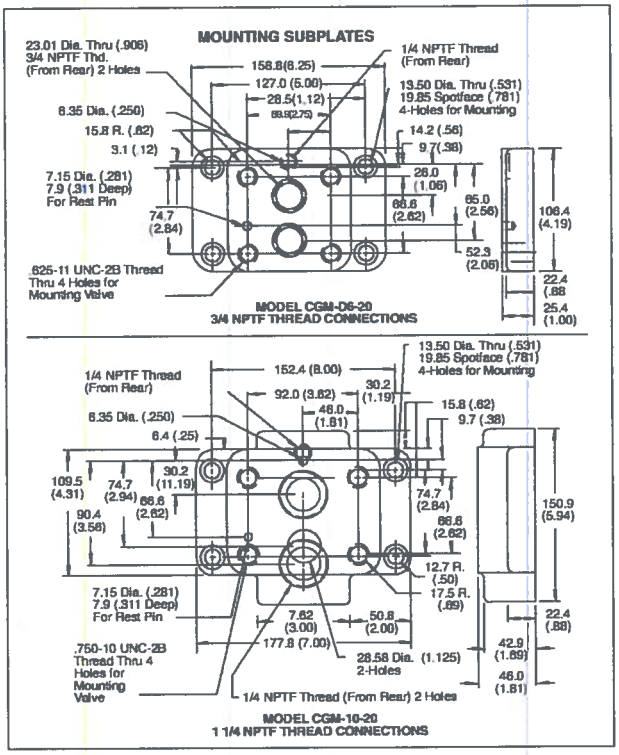


Figure 7. CGE** - * -20 valve mounting data.

14. Assemble leaf spring (9) and flapper plate (S/A) (8) with screws (10). Inspect the leaf spring; if the leaf spring is obwed, position the obw outward. Torque screws (10) to 12-14 lb. in., (1.4 - 1.6 N.m). Screws (10) should straighten the leaf spring against the flapper plate.

NOTE

In the following step, one master shim (11a) (thick) and four adjustment shims (11) (thin) are normally used. The shims set the magnetic gap of the valve.

15. Insert screws (6) and washers (6a) through flapper plate S/A (8) opening into leaf spring (9). Hold screws in place and located shims over screws against leaf spring (9). Thread screws into frame (22) lightly. Position flapper plate S/A (8) to prevent mechanical contact with side of nozzle (12). Torque screws (6) to 12-14 lb. in,., (1.4 - 1.6 N.m). Check the magnetic gap as follows:

a. 1000 PSI models: Refer to Figure 5 and carefully measure the distance between leaf spring (8) and dampening shim (13). Use a feeler gage. The distance should be 0.017 to 0.021 inches. (0.43 - 0.53 mm). Add or remove shims (11) to meet this dimension.

b. 3000 PSI models: Refer to Figure 5 and carefully measure the distance between leaf spring (9) and frame (22). Use a feeler gage. The distance should be 0.035 to 0.037 inches. (0.89 - 0.94 mm). Add or remove shims (11) to meet this dimension.

16. If adjustment screw (7) was removed from flapper plate (8), thread a new adjustment screw (7) into flapper plate (8).

Meausre the hydraulic gap with a feeler gage to set the clearance between nozzle (12) and adjustment screw (7). the gap should be 0.004 - 0.005 inch, (0.10-0.13 mm). This applies to 1000 & 3000 PSI models. Refer to Figure 6.

17. Install parts (5) through (1). Cross torque screws (3) to 35-40 lbf. in., (4-4.5 N.m)

Section VII – Test Procedure

A. Test Conditions

Hydraulics:

Fluid medium	SAW 10W oil or equivalent
Fluid Temperature	100±5° F.
Maximum Pressure	3500 PSI

Test Volume:

CGE-06	20 USGPM
CG3-10	50 USGPM

B. Electrical Specifications

An adjustable current source from zero (0) to 500 milliamperes is required. Vickers EMCS-P-30 is recommended. Refer to installation drawing 521557.

C. Test. (Preliminary Adjustments)

CAUTION

The CGE pilot valve is externally drained through the cover. Connect drain line into the cover with a 0.5625-18 UNF-2B straight thread connection for 0.375 O.D. tubing. Drain line must be full size, unrestricted and connected directly to the reservoir so that it terminates below the fluid level. No other lines are to be connected to this line.

NOTE

System filtration should be 35 micron absolute full flow to prevent contamination of the pilot valve.

1. Before mounting the assembled valve for test, manually move piston (59, Figure 4) to full stroke with a hex wrench or similar tool. If piston (5) binds refer to paragraph VI, step E.12 and paragraph VI, step F.6.

NOTE

A suitable subplate is requiredto mount the valve. A CGE subplate properly piped is recommended. See Figure 7.

NOTE

A sample hydraulic and electrical circuit is shown in Figure 8. Modify an existing test stand or obtain necessary components to assemble the test circuit.

NOTE

If the valve is an -S6 model, connect a 3000 PSI, 35 micron filter to the main stage fo the valve. Filter ports are located on hte front side of the main stage. See Figure 9.

2.Connect valve to the test circuit and attach power supply (12, Figure 8). The connections can be made without regard to polarity.

3. Set dither adjustment on power supply to minimum.

4. Turn power supply current control know to zero (0).

CAUTION

In the following step, if milliammeter (11, Figure 8) reads in reverse, reverse the meter connecting wires.

5. Crack the power supply control and observe millammeter for polarity. Correct wiring if necessary. Return control to zero current.

6. Switch directional valve (8, Figure 8) to allow flow through flow meter and adjust flow rate for valve under tetst. (Flow rates tabulated in paragraph VII.A. Test Conditions).

7. Adjust relief valve (2, Figure 8) to minimum pressure and open globe valve (1)

8. Switch directional valve to center blocked condition. Gradually close globe valve (1, Figure 8) and adjust relief valve (2) until pressure reading on gage (7) is 3750 PSI. Globe valve must be completely closed at completion of this step.

NOTE

Needle valve (6, Figure 8) is used as a snubber for gage (7).

D. Manual Adjustment Test

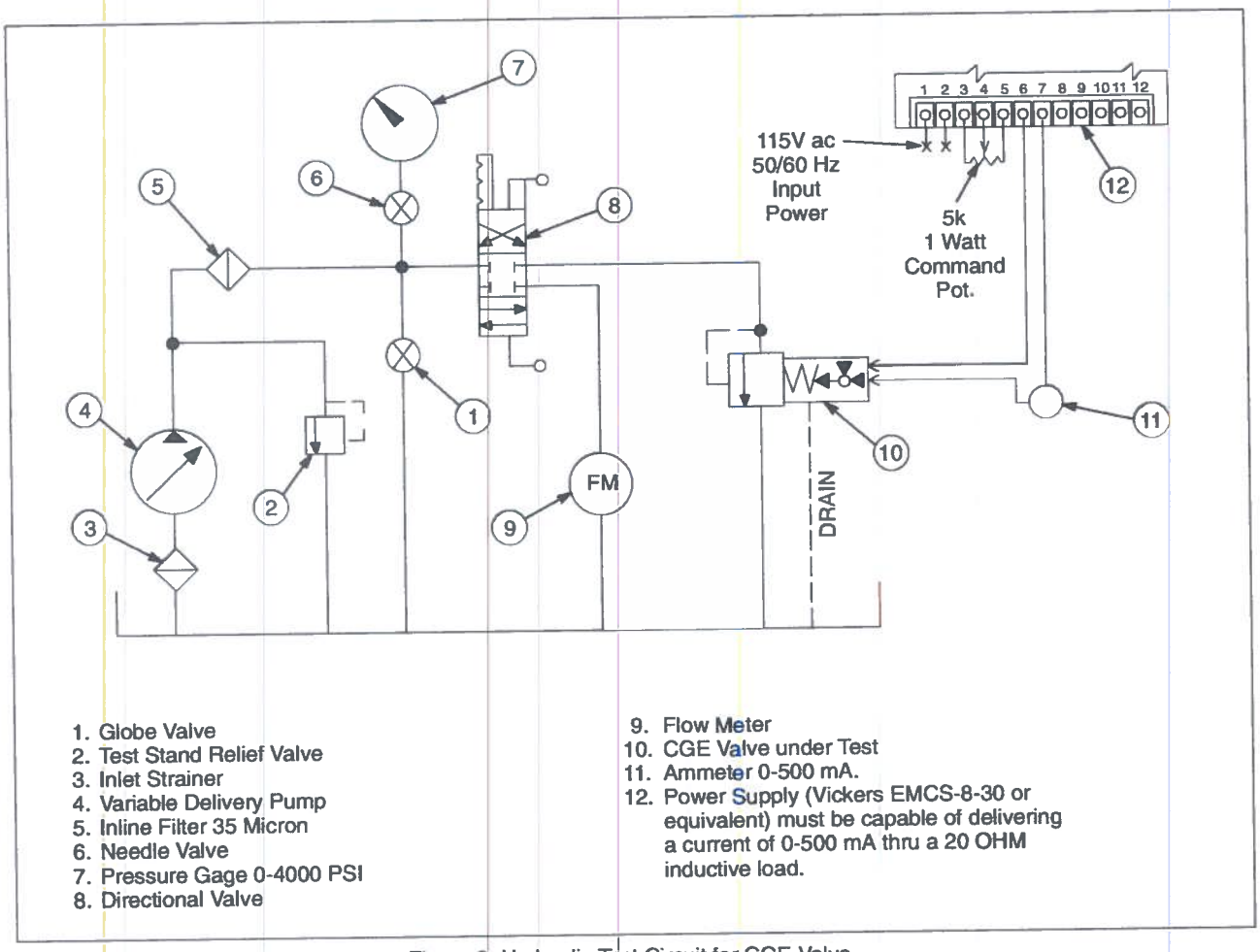
1. Switch directional valve to divert flow through the valve under test (10, Figure 8). Turn relief valve adjustment screw (41, Figure 3) all the way in. Pressure should be within range "A", perform the following adjustment procedure.

Model	"A" PSI	"B" PSI	"C" PSI	"D" PSI	"E" PSI	"F" PSI
CG3-**-1	1200/ 1300	1000	700	15	125	1250
CG3-**-3	3450/ 3700	3000	2500	45	1500	3500

Table 4.

WARNING

To prevent personal infury, remove all power from the hydraulic system or divert all system flow to the reservoir through flow meter (9, Figure 8) when work is performed to the valve under test.



1. Globe Valve
2. Test Stand Relief Valve
3. Inlet Strainer
4. Variable Delivery Pump
5. Inline Filter 35 Micron
6. Needle Valve
7. Pressure Gage 0-4000 PSI
8. Directional Valve
9. Flow Meter
10. CGE Valve under Test
11. Ammeter 0-500 mA.
12. Power Supply (Vickers EMCS-8-30 or equivalent) must be capable of delivering a current of 0-500 mA thru a 20 OHM inductive load.

Figure 8. Hydraulic Test Circuit for CGE Valve.

NOTE

In the following step, adding shims increase pressure while removing shims decrease pressure.

2. CGE-**-1-2*

Add or remove shims to bring pressure shown on gage (7, Figure 8) within range "A" of table 4. Use the 0.025 inch thick shim, (44, Figure 3), for a 100 PSI change.

CGE-**-3-2*

Add or remove shims to bring pressure shown on gage (7, Figure 8) within range "A" of table 4. Use the 0.025 inch thick shim, (44, Figure 3), for a 230 PSI change and the 0.250 thich shim for a 700 PSI change.

3. Turn relief valve adjustment screw to pressure "B" shown in Table 4. Check for porosity and external leaks. Drop pressure to valvue "C" with globe valve 1, (Figure 8), and check te leakage from discharge port, not to exceed "D".

4. Adjust relief valve pressure setting from "C" down to "E" then up to "F" for pressure range test. Tighten lock nut (42, Figure 3).

5. Switch directional valve (8, Figure 8) to divert flow through flow meter.

6. Remove plug (24, Figure 3) and reverse button (26, Figure 3) to the normal position. Reinstall plug (24) and secure.

E. Electrical Pilot Adjustment

1. Switch directinal valve (8, Figure 8) to divert flow to the valve under test (10, Figure 8).

2. Make sure dither is off (dither control fully counter-clockwise). Increase current to the valve under test until rated pressure is obtained. The current at this time should be 475 to 400 millamperes for the 3000 PSI models and between 465 and 500 for the 1000 PSI models. If the current is not within this range, remove current, shift directional valve (9, Figure 8) to direct oil to the flow meter and remove pilot valve cover (4, Figure 3). If the current reading is low, add shims (11, Figure 3) as required. If current reading is high, remove shims as needed. Each shim will change the pressure setting approximately 25 PSI on 1000 PSI models and 150 PSI on 300 PSI models.

3. Adjust the celarance between nozzle (12, Figure 3) and flapper adjustment screw (7, Figure 3) to be between 0.004 - 0.005 inch, (0.10 - 0.13 mm). Use f feeler gage for this adjustment.

4. Assemble cover (4, Figure 3) to the pilot valve with screws (3, Figure 3).

5. Repeat steps E.1. and E.2 to verify adjustment. Repeat the complete "Electrical Pilot Adjustment Precedure", until noted results are obtained.

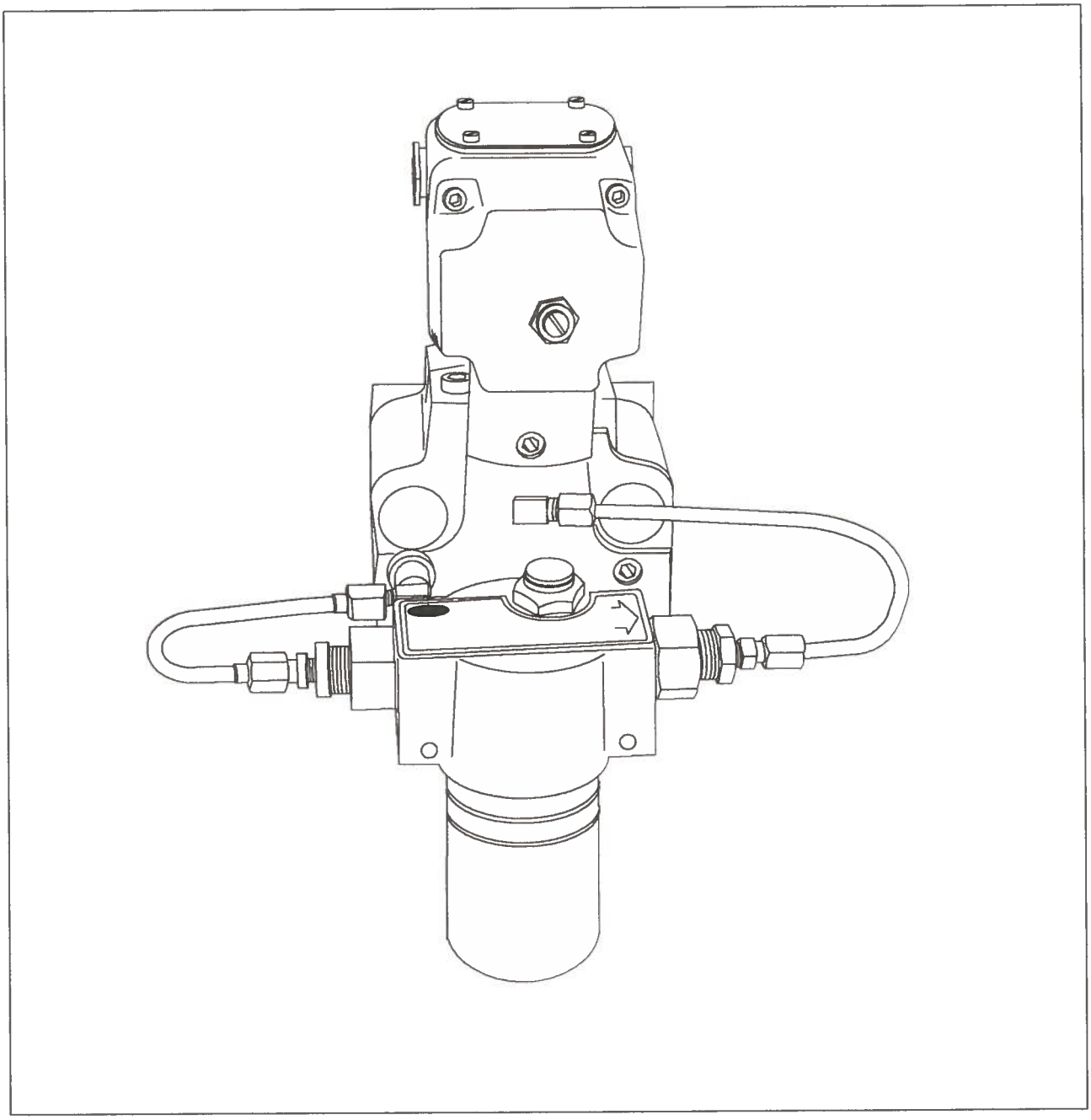


Figure 9. Filter connection for S-6 models.

Service Data

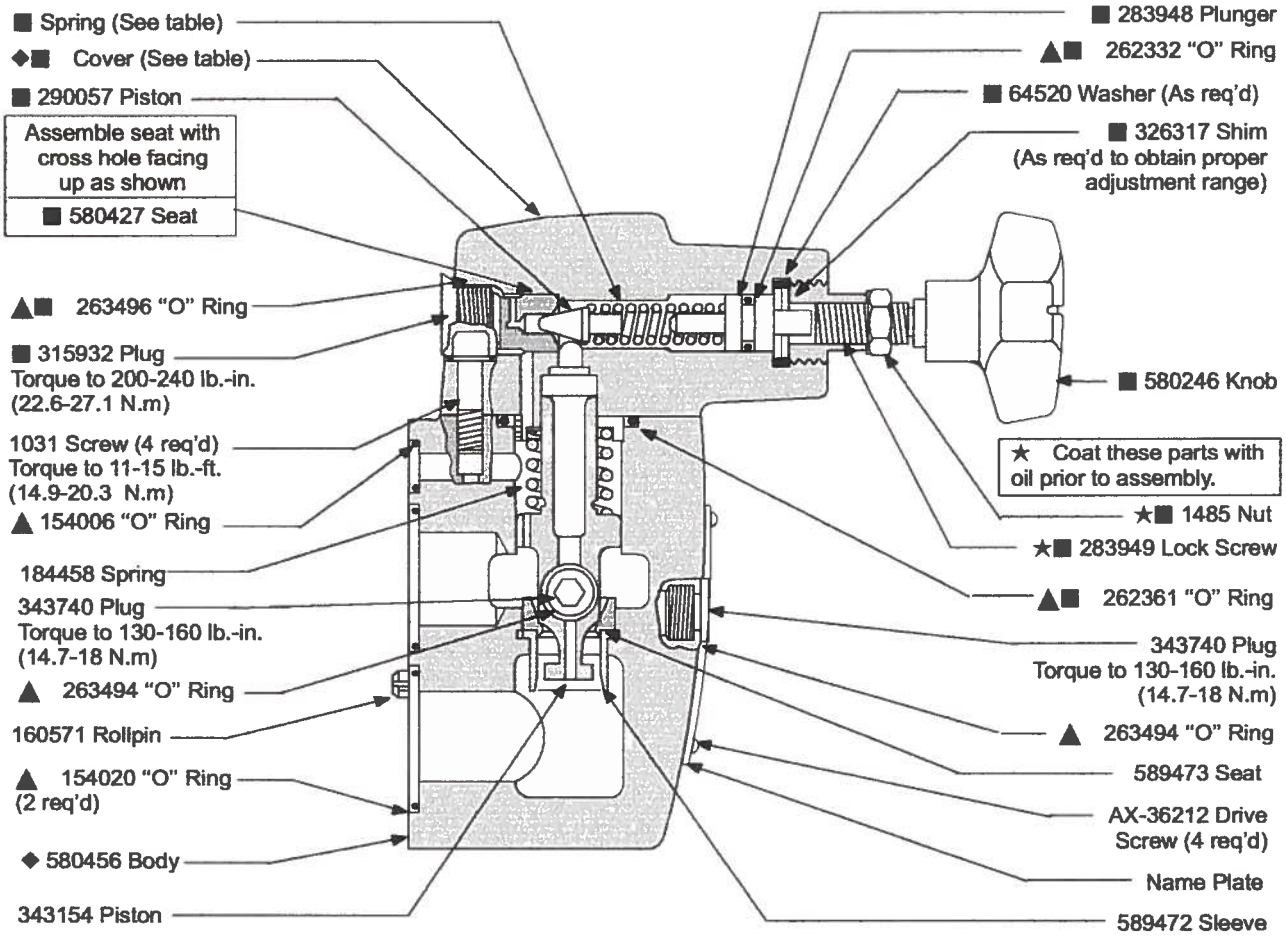
Vickers®

Relief Valves

Balanced Piston Type Relief Valves

CG-H06-BV-50
CG-H06-CV-50
CG-H06-FV-50

Model	■ Spring	Pressure Range PSI	■ Included in Cover S/A
CG-H06-BV-50	2280	125-1000	941280
CG-H06-CV-50	583937	500-2000	941281
CG-H06-FV-50	2281	1500-3000	941282



◆ Not available for sale as individual parts

All seals, except interface, are F3. Use the F3 seal kit to service all units.

▲ Included in F3 Seal Kit 919444

VICKERS

Model Code Breakdown

(F3) C G - H06 - * - V - 50

1 2 3 4 5 6

1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a regsitered trademark of E.I. DuPont

2 Model Series

CG - Relief valve, manifold or subplate mounted

3 Size

H06 - 3/4 inch high flow

4 Pressure Range

B - 125-1000
C - 500-2000
F - 1500-3000

5 Vent Pressure

V - High vent pressure

6 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Service Data

Vickers®

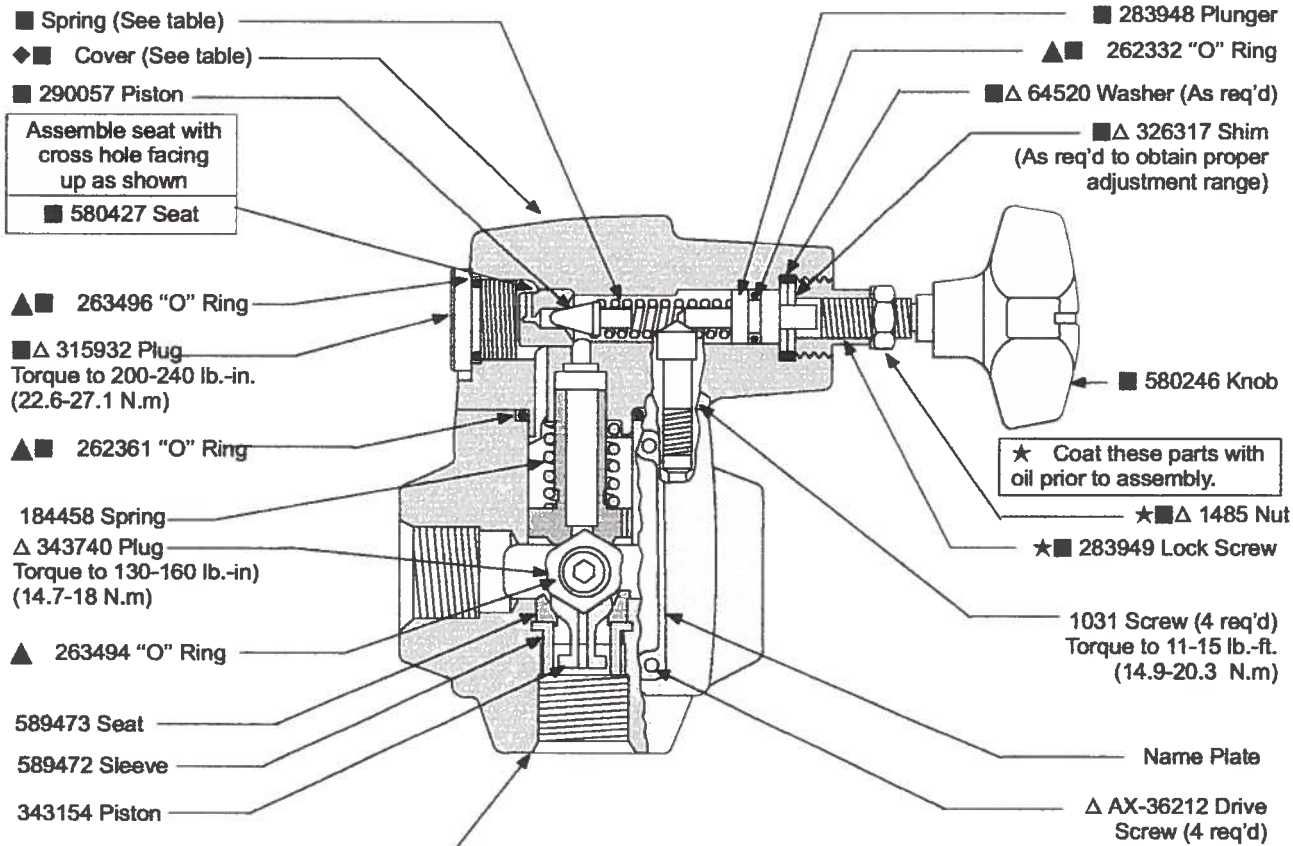
Pressure Relief

EATON

Balanced Piston High Flow Relief & Sequence Valve

CS-H06-*-V(Y)-50

Model	■ Spring	Pressure Range PSI	■ Included in Cover S/A
C*-H06-BV-50	2280	125-1000	941280
C*-H06-BVY-50			941283
C*-H06-CV-50	583937	500-2000	941281
C*-H06-CVY-50			941284
C*-H06-FV-50	2281	1500-3000	941282
C*-H06-FVY-50			941285


■ Spring (See table)
◆■ Cover (See table)
■ 290057 Piston
Assemble seat with cross hole facing up as shown
■ 580427 Seat
▲■ 263496 "O" Ring
■Δ 315932 Plug
Torque to 200-240 lb.-in. (22.6-27.1 N.m)
▲■ 262361 "O" Ring
184458 Spring
Δ 343740 Plug
Torque to 130-160 lb.-in) (14.7-18 N.m)
▲ 263494 "O" Ring
589473 Seat
589472 Sleeve
343154 Piston
■ 283948 Plunger
▲■ 262332 "O" Ring
■Δ 64520 Washer (As req'd)
■Δ 326317 Shim (As req'd to obtain proper adjustment range)
■ 580246 Knob
★ Coat these parts with oil prior to assembly.
★■Δ 1485 Nut
★■ 283949 Lock Screw
1031 Screw (4 req'd) Torque to 11-15 lb.-ft. (14.9-20.3 N.m)
Name Plate
Δ AX-36212 Drive Screw (4 req'd)

Model	◆ Body
CS-H06-*V-50	581701

Δ Available in Lot Kits of 25 pieces	
1485	944064
36212	944053
64520	944068
326317	944073
343740	944038
315932	944062

◆ Not available for sale as individual parts

▲ Included in F3 Seal Kit 919922

VICKERS

Model Code Breakdown

(F3) C * - H06 - * - V (Y) - 50

1 2 3 4 5 6 7 8

1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a regsitered trademark of E.I. DuPont

2 Model Series

C - Relief valve

3 Thread Type

S - SAE straight

4 Size

H06 - 3/4 inch high flow

5 Pressure Range

B - 125-1000
C - 500-2000
F - 1500-3000

6 Vent Pressure

V - High vent pressure

7 External Drain Feature

Y - Sequence valve
(Omit for standard relief.)

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Service Data

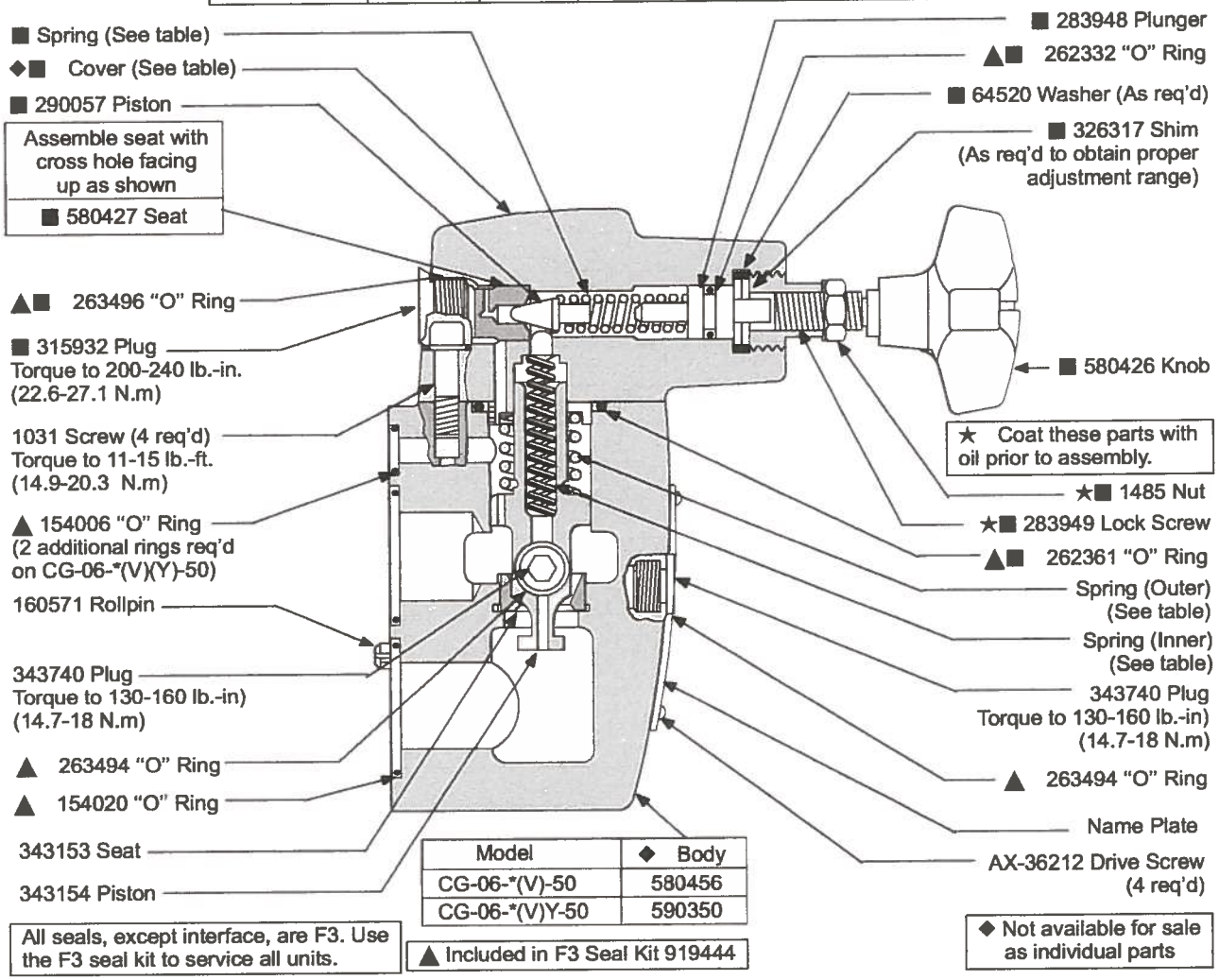
Vickers®

Relief Valves

Balanced Piston Type Relief & Sequence Valves

CG-06-*-(V)(Y)-50

Model	■ Cover	Spring (Outer)	Spring (Inner)	■ Spring	Pressure Range PSI	■ Included in Cover S/A
CG-06-B-50	581702		2077	2280	125-1000	941280
CG-06-BV-50		184458				
CG-06-BVY-50	590315					941283
CG-06-BY-50			2077			
CG-06-C-50	581702			583937	500-2000	941281
CG-06-CV-50		184458				
CG-06-CVY-50	590315					941284
CG-06-CY-50			2077			
CG-06-F-50	581702			2281	1500-3000	941282
CG-06-FV-50		184458				
CG-06-FVY-50	590315					941285
CG-06-FY-50			2077			


■ Spring (See table)
◆■ Cover (See table)
■ 290057 Piston
Assemble seat with cross hole facing up as shown
■ 580427 Seat
▲■ 263496 "O" Ring
■ 315932 Plug
Torque to 200-240 lb.-in. (22.6-27.1 N.m)
1031 Screw (4 req'd)
Torque to 11-15 lb.-ft. (14.9-20.3 N.m)
▲ 154006 "O" Ring
(2 additional rings req'd on CG-06-*(V)(Y)-50)
160571 Rollpin
343740 Plug
Torque to 130-160 lb.-in) (14.7-18 N.m)
▲ 263494 "O" Ring
▲ 154020 "O" Ring
343153 Seat
343154 Piston
■ 283948 Plunger
▲■ 262332 "O" Ring
■ 64520 Washer (As req'd)
■ 326317 Shim
(As req'd to obtain proper adjustment range)
■ 580426 Knob
★ Coat these parts with oil prior to assembly.
★■ 1485 Nut
★■ 283949 Lock Screw
▲■ 262361 "O" Ring
Spring (Outer) (See table)
Spring (Inner) (See table)
343740 Plug
Torque to 130-160 lb.-in) (14.7-18 N.m)
▲ 263494 "O" Ring
Name Plate
AX-36212 Drive Screw (4 req'd)

Model	◆ Body
CG-06-*(V)-50	580456
CG-06-*(V)Y-50	590350

All seals, except interface, are F3. Use the F3 seal kit to service all units.

▲ Included in F3 Seal Kit 919444

◆ Not available for sale as individual parts

VICKERS

Released 11-1-85

I-3368-S

Model Code Breakdown

(F3) C G - 06 - * - (V) (Y) - 50

1 2 3 4 5 6 7

1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a regsitered trademark of E.I. DuPont

2 Model Series

CG - Relief valve, manifold or subplate mounted

3 Size

06 - 3/4 inch

4 Pressure Range

B - 125-1000 PSI
C - 500-2000 PSI
F - 1500-3000 PSI

5 Vent Pressure

V - High vent pressure
(Omit for standard vent pressure.)

6 External Drain Feature

Y - Sequence valve
(Omit for standard relief.)

7 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

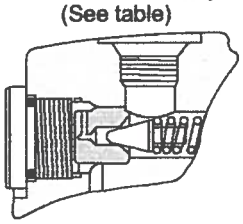
Printed in U.S.A.

Relief Valves

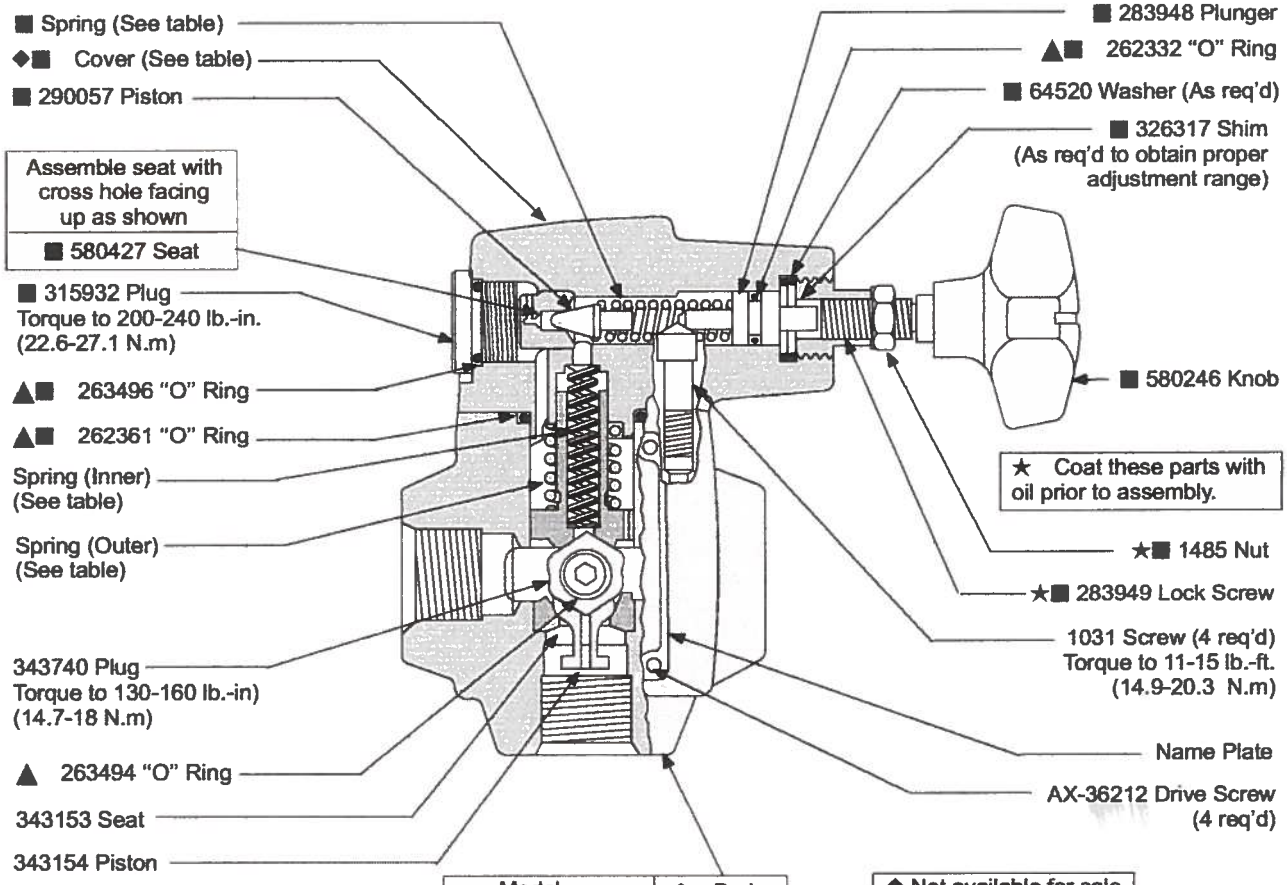
Balanced Piston Type Relief & Sequence Valves

(F3)C*-**-*-(V)(Y)-50

"Y" Cover Assembly
(See table)



Model	■ Cover	Spring (Outer)	Spring (Inner)	■ Spring	Pressure Range PSI	■ Included in Cover S/A
C*-0*-B-50	581702		2077	2280	125-1000	941280
C*-0*-BV-50		184458				
C*-0*-BVY-50	590307					941283
C*-0*-BY-50			2077			
C*-0*-C-50	581702			583937	500-2000	941281
C*-0*-CV-50		184458				
C*-0*-CVY-50	590307					941284
C*-0*-CY-50			2077			
C*-0*-F-50	581702			2281	1500-3000	941282
C*-0*-FV-50		184458				
C*-0*-FVY-50	590307					941285
C*-0*-FY-50			2077			

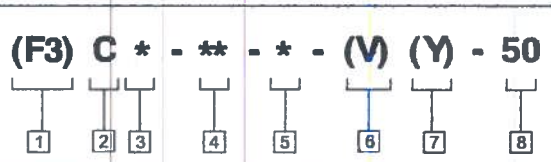


Model	◆ Body
CS-03-*(V)-50	590407
CS-06-*(V)(Y)-50	581701
CT-06-*(V)(Y)-50	590348

◆ Not available for sale as individual parts

▲ Included in F3 Seal Kit 919922

Model Code Breakdown



1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a regsitered trademark of E.I. DuPont

2 Model Series

C - Relief valve

3 Thread Type

S - SAE straight
T - NPTF pipe

4 Size

03 - 3/8 inch
06 - 3/4 inch

5 Pressure Range

B - 125-1000
C - 500-2000
F - 1500-3000

6 Vent Pressure

V - High vent pressure
(Omit for standard vent pressure.)

7 External Drain Feature

Y - Sequence valve
(Omit for standard relief.)

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Service Data

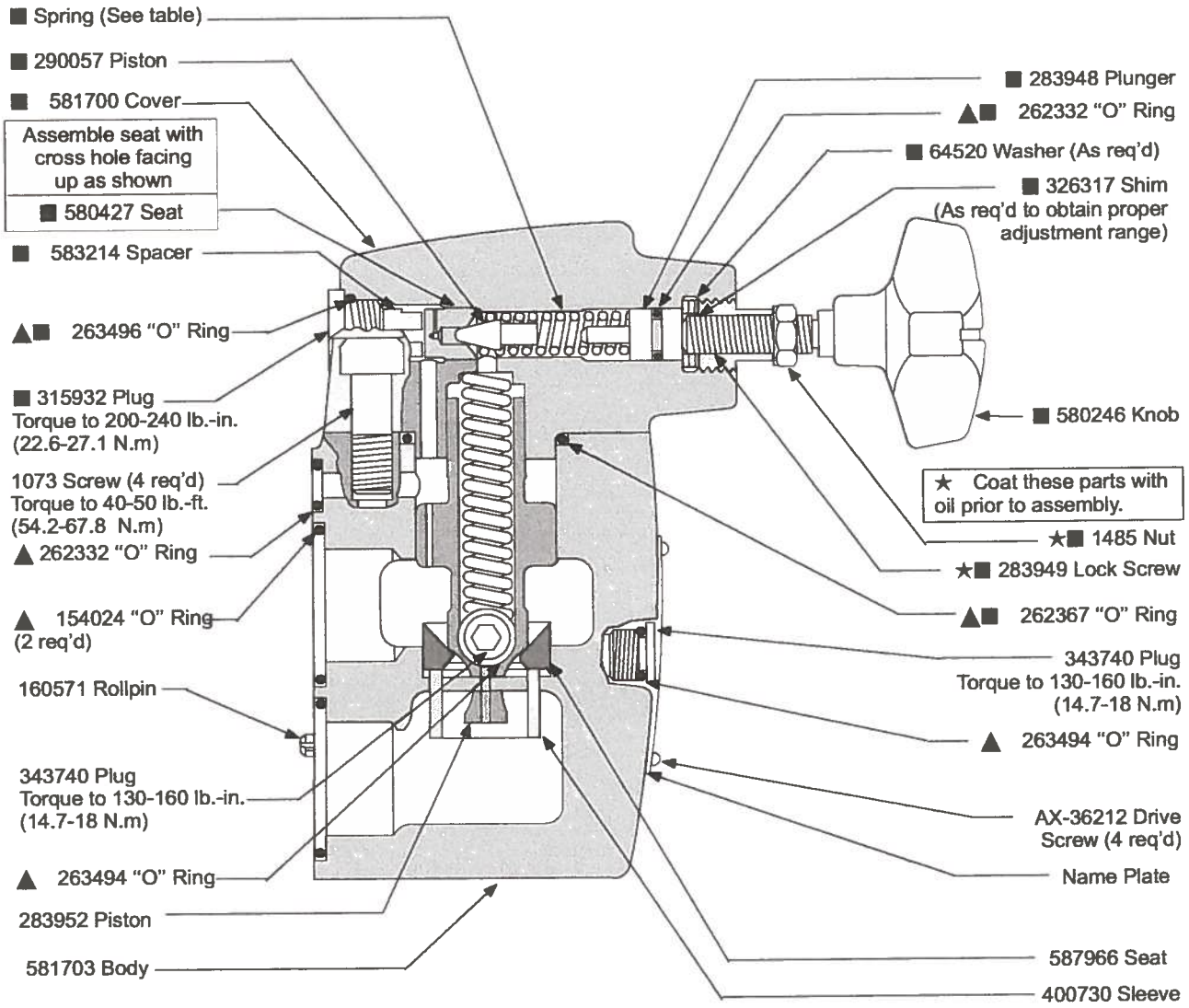
Vickers®

Relief Valves

Balanced Piston Type High Flow Relief Valve

CG-H10-*V-30

Model	■ Spring	Pressure Range PSI	■ Included in Cover S/A
CG-H10-BV-30	2280	125-1000	941286
CG-H10-CV-30	583937	500-2000	941287
CG-H10-FV-30	2281	1500-3000	941288


■ Spring (See table)
■ 290057 Piston
■ 581700 Cover
Assemble seat with cross hole facing up as shown
■ 580427 Seat
■ 583214 Spacer
▲■ 263496 "O" Ring
■ 315932 Plug
Torque to 200-240 lb.-in. (22.6-27.1 N.m)
1073 Screw (4 req'd)
Torque to 40-50 lb.-ft. (54.2-67.8 N.m)
▲ 262332 "O" Ring
▲ 154024 "O" Ring (2 req'd)
160571 Rollpin
343740 Plug
Torque to 130-160 lb.-in. (14.7-18 N.m)
▲ 263494 "O" Ring
283952 Piston
581703 Body
■ 283948 Plunger
▲■ 262332 "O" Ring
■ 64520 Washer (As req'd)
■ 326317 Shim (As req'd to obtain proper adjustment range)
■ 580246 Knob
★ Coat these parts with oil prior to assembly.
★■ 1485 Nut
★■ 283949 Lock Screw
▲■ 262367 "O" Ring
343740 Plug
Torque to 130-160 lb.-in. (14.7-18 N.m)
▲ 263494 "O" Ring
AX-36212 Drive Screw (4 req'd)
Name Plate
587966 Seat
400730 Sleeve

All seals, except interface, are F3. Use the F3 seal kit to service all units.

▲ Included in F3 Seal Kit 919920

VICKERS

Model Code Breakdown

(F3) C G - H10 - * - V - 30

1 2 3 4 5 6

1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a regsitered trademark of E.I. DuPont

2 Model Series

CG - Relief valve, manifold or subplate mounted

3 Size

H10 - 1-1/4 inch high flow

4 Pressure Range

B - 125-1000
C - 500-2000
F - 1500-3000

5 Vent Pressure

V - High vent pressure

6 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Vickers®

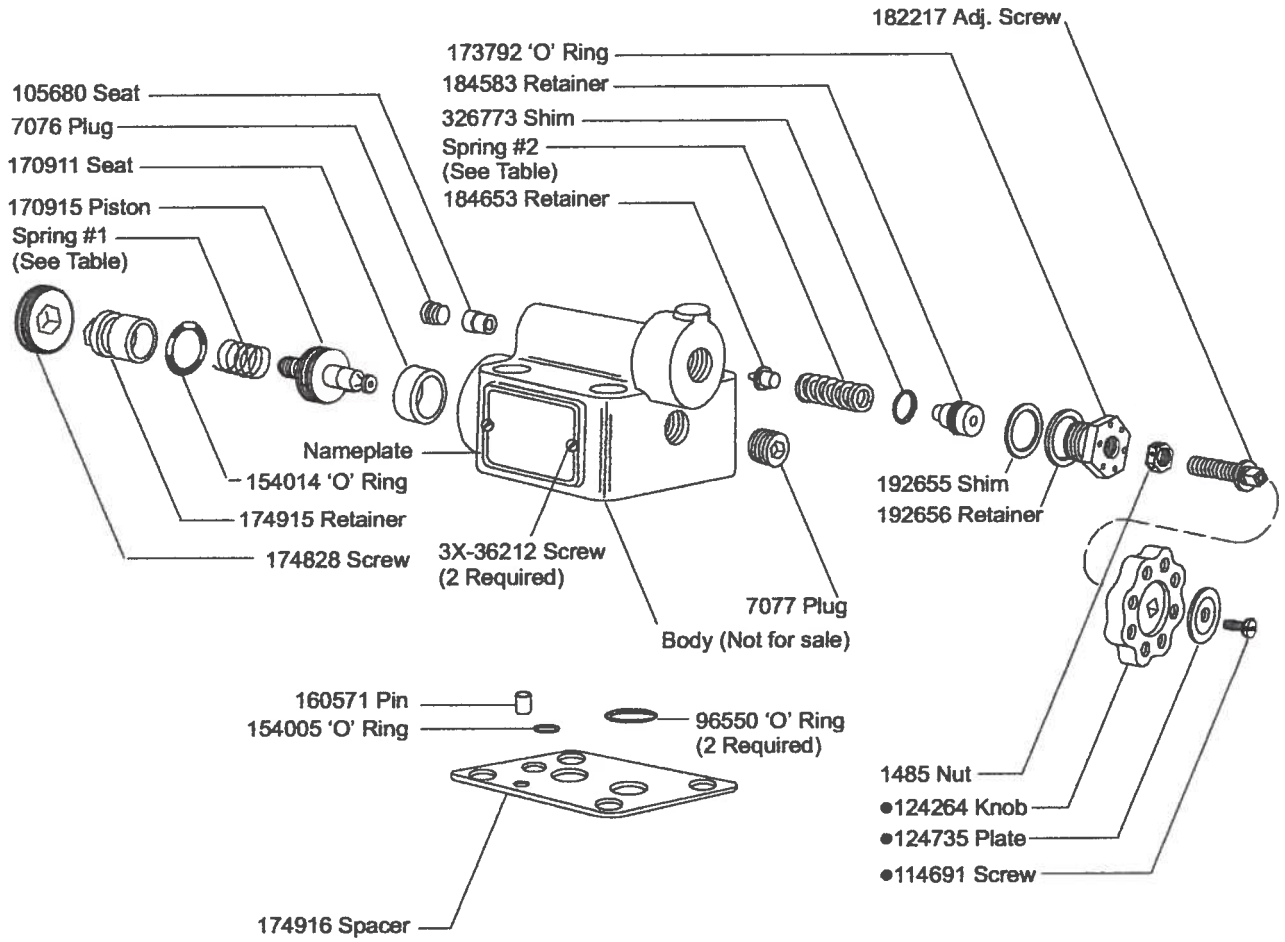
Relief Valves

EATON

High Pressure Relief Valves

CG–03–* *–10

MODEL	PRESSURE RANGE	SPRING #1	SPRING #2
CG-03-B-10	90 - 1000	175070	175071
CG-03-C-10	500 - 2000		175072
CG-03-F-10	1500 - 3000		175073
CG-03-BV-10	75 - 1000	184458	175071
CG-03-CV-10	500 - 2000		175072
CG-03-FV-10	1500 - 3000		175073



● Models with handwheel controls are available. Specify in model code by adding suffix -S81.
Example: CG-03-*-10-S81

VICKERS

Model Code Breakdown

C G - 03 - B (V) - 10

1 2 3 4 5 6

1 Relief Valve

2 Mounting Type

G - Manifold or Subplate

3 Valve Size

03 - $^{3}/_{8}$" Nominal size

4 Pressure Range

B - 75-1000 psi
C - 500-2000 psi
F - 1500-3000 psi

5 High Vent Spring

Omit if not required

6 Design

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Vickers®

Service Data

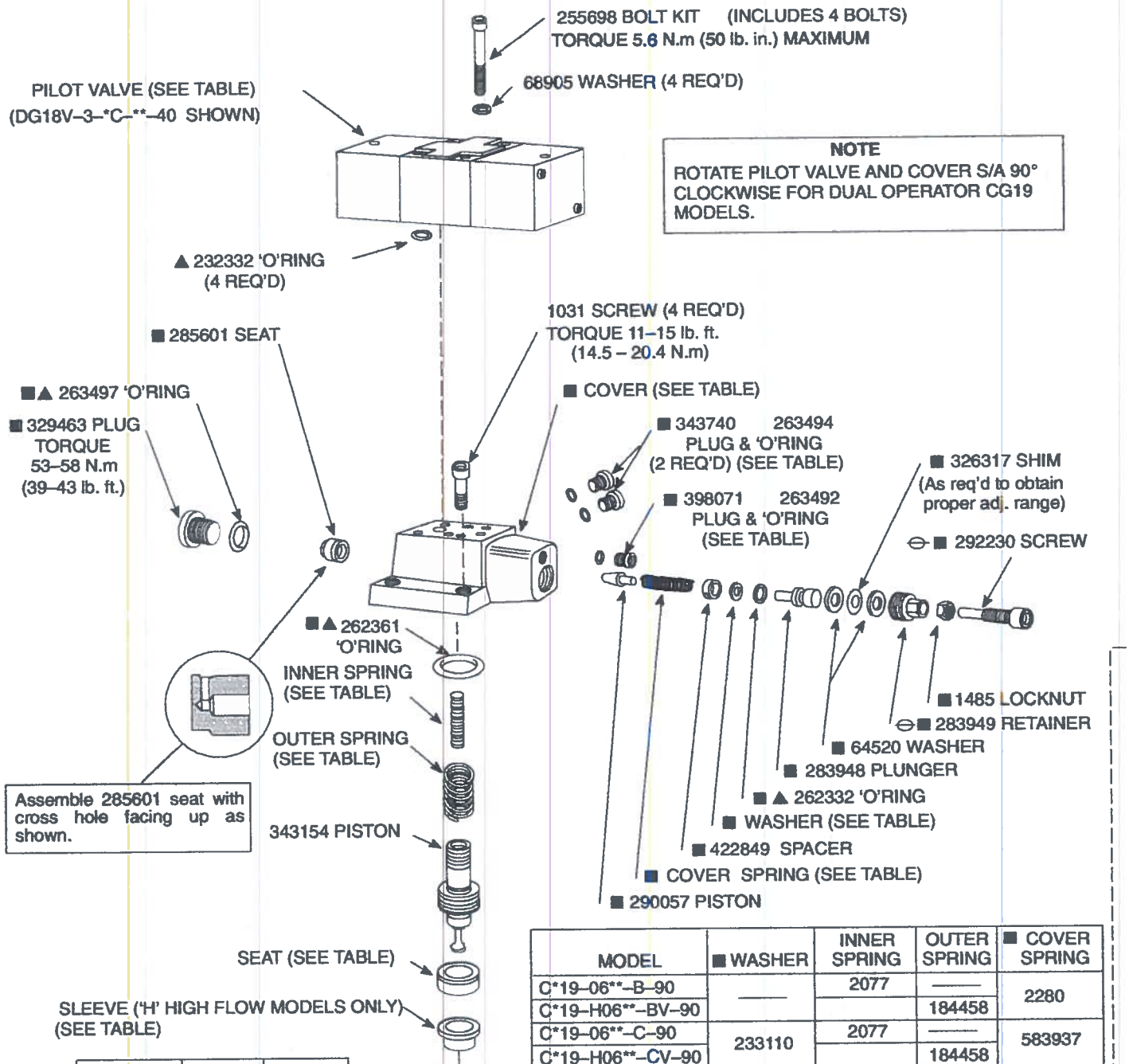
Pressure Relief

Air Controlled Relief Valve

(F3)-CG19-(H)06(P)-*(V)-(***)-90**
(F3)-CS19-(H)03/06(P)-*(V)-(***)-90**
(F3)-CT19-06(P)-*-(***)-90**

VICKERS

Released 09-01-87



MODEL	SEAT	SLEEVE
C*19–03/06	343153	——
C*19–H06	589473	589472

MODEL	■ WASHER	INNER SPRING	OUTER SPRING	■ COVER SPRING
C*19–06**–B–90	——	2077	——	2280
C*19–H06**–BV–90			184458	
C*19–06**–C–90	233110	2077	——	583937
C*19–H06**–CV–90			184458	
C*19–06**–F–90	——	2077	——	2281
C*19–H06**–FV–90			184458	

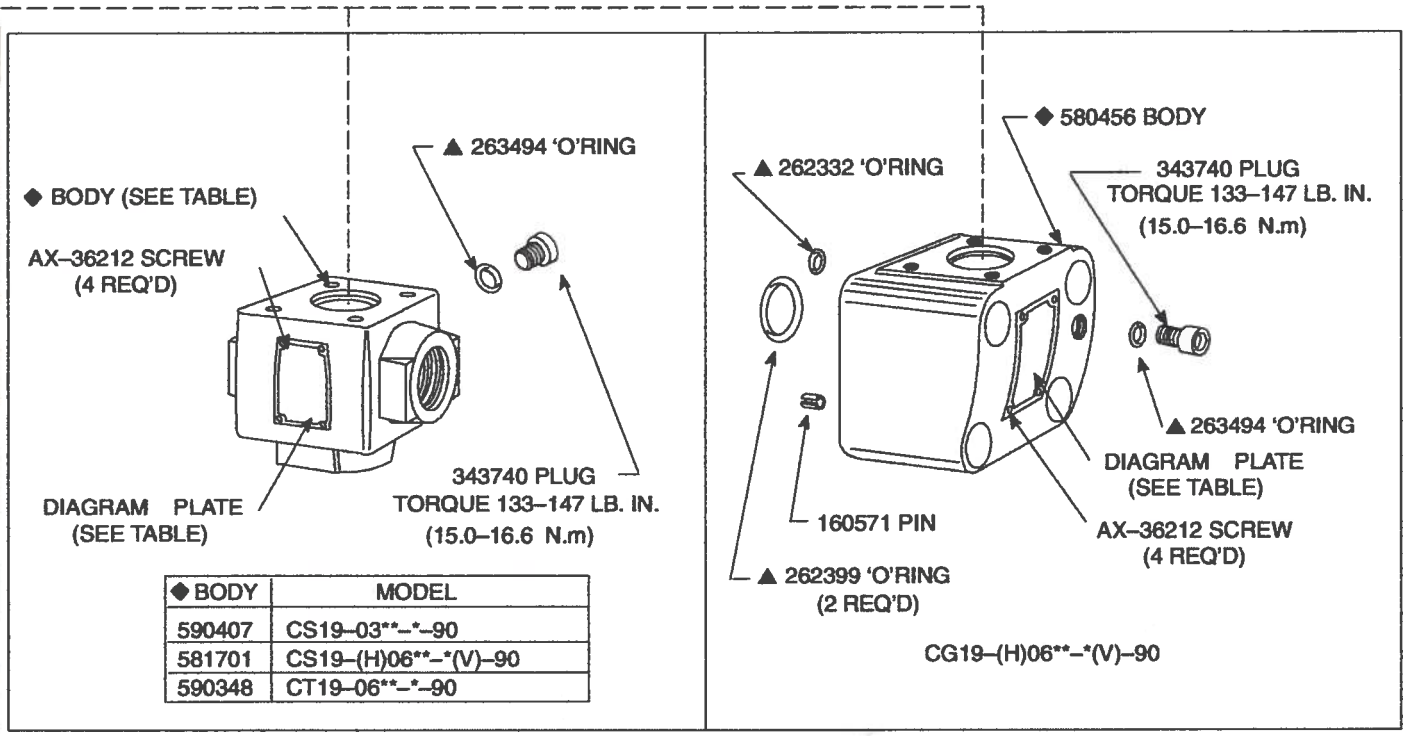
MODEL	DIAGRAM PLATE	PILOT VALVE	PILOT VALVE PARTS DRWG.
C*19–(H)060A(P)–*(V)–90	422864	DG18V–3–0BL–40	I–3616–S
C*19–(H)061A(P)–*(V)–90	422865	DG18V–3–2AL–40	
C*19–(H)062A(P)–*(V)–90	423814	DG18V–3–2BL–40	
C*19–(H)060C–*(V)–90	422862	DG18V–3–0C–40	
C*19–(H)062C–*(V)–90	422863	DG18V–3–2C–40	
C*19–(H)060F(P)–*(V)–90	———	DG18V–3–0FL–40	

MODEL	■ COVER S/A
C*19–(H)600A/F–B(V)–90	942432
C*19–(H)060A/F–C(V)–90	942433
C*19–(H)060A/F–F(V)–90	942434
C*19–(H)061A–B(V)–90	942435
C*19–(H)062A–B(V)–90	
C*19–(H)06*C–B(V)–90	
C*19–(H)061A–C(V)–90	942436
C*19–(H)062A–C(V)–90	
C*19–(H)06*C–C(V)–90	
C*19–(H)061A–F(V)–90	942437
C*19–(H)062A–F(V)–90	
C*19–(H)06*C–F(V)–90	

MODEL	■ COVER	■ PLUG/'O'RING (2 REQ'D)	■ PLUG/'O'RING
C*19–(H)060A–90	422828	———	———
C*19–(H)061A–90	424203	343740/▲263494	398071/▲263492
C*19–(H)062A–90			
C*19–(H)06*C–90			

NOTE
PARTS PREFIXED WITH A SYMBOL ARE AVAILABLE ONLY IN KITS.

■ INCLUDED IN COVER S/A
▲INCLUDED IN F3 SEAL KIT 920345 (INCLUDES PILOT VALVE SEALS)
⊖ LUBRICATE WITH OIL BEFORE ASSEMBLY
◆ NOT AVAILABLE FOR SALE


◆ BODY (SEE TABLE)
AX–36212 SCREW (4 REQ'D)
▲ 263494 'O'RING
DIAGRAM PLATE (SEE TABLE)
343740 PLUG TORQUE 133–147 LB. IN. (15.0–16.6 N.m)
◆ 580456 BODY
▲ 262332 'O'RING
343740 PLUG TORQUE 133–147 LB. IN. (15.0–16.6 N.m)
▲ 263494 'O'RING
DIAGRAM PLATE (SEE TABLE)
160571 PIN
AX–36212 SCREW (4 REQ'D)
▲ 262399 'O'RING (2 REQ'D)
CG19–(H)06**–*(V)–90

◆ BODY	MODEL
590407	CS19–03**–*–90
581701	CS19–(H)06**–*(V)–90
590348	CT19–06**–*–90

Model Code

(F3) – C	*	19 – (H)	**	*	*	(P) –	*	(V) – (***) – 90
1	2	3 4	5	6	7	8	9	10 11 12 13

1 Seals for Mineral Oil & Fire Resistant Fluids
(Omit if not Required)

2 Relief Valve

3 Connections

G – Subplate Mounting
S – Straight Threads
T – NPTF Threads

4 Air Controlled, Pilot Operated

5 High Flow
CG & CS Models Only
(Omit if not Required)

6 Valve Size

03 – 3/8 inch
06 – 3/4 inch

7 Pilot Valve Spool Type

8 Pilot Valve Function

A – Spring Offset (Single Operator)
B – Spring Centered (Operator 'A' Removed)
C – Spring Centered (Dual Operator)
F – Spring Offset (Pressurize to Center)

9 Manual Operator Option in End Cap for Single Operator Models Only
(Omit if not Required)

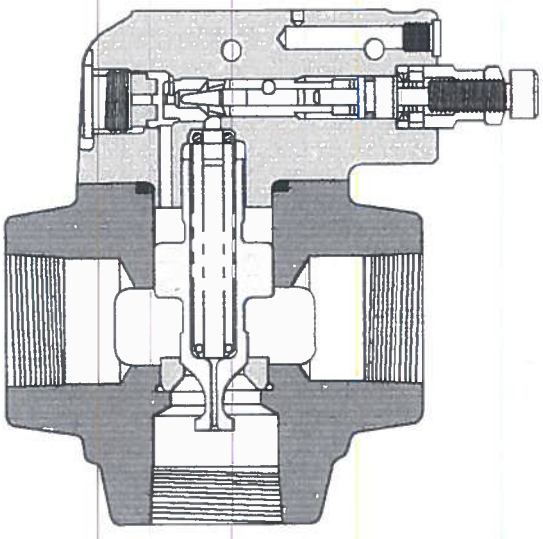
10 Pressure Range

B – 125–1000 psi
C – 500–2000 psi
F – 1500–3000 psi

11 High Vent
(Omit if not Required)

12 Pilot Valve Port Orifices
(Omit if not Required)

13 Design



RELIEF VALVE SECTIONAL VIEW WITHOUT PILOT VALVE

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP, OFR and OFRS filter series are recommended.

Litho in U.S.A.

Vickers®

Service Data

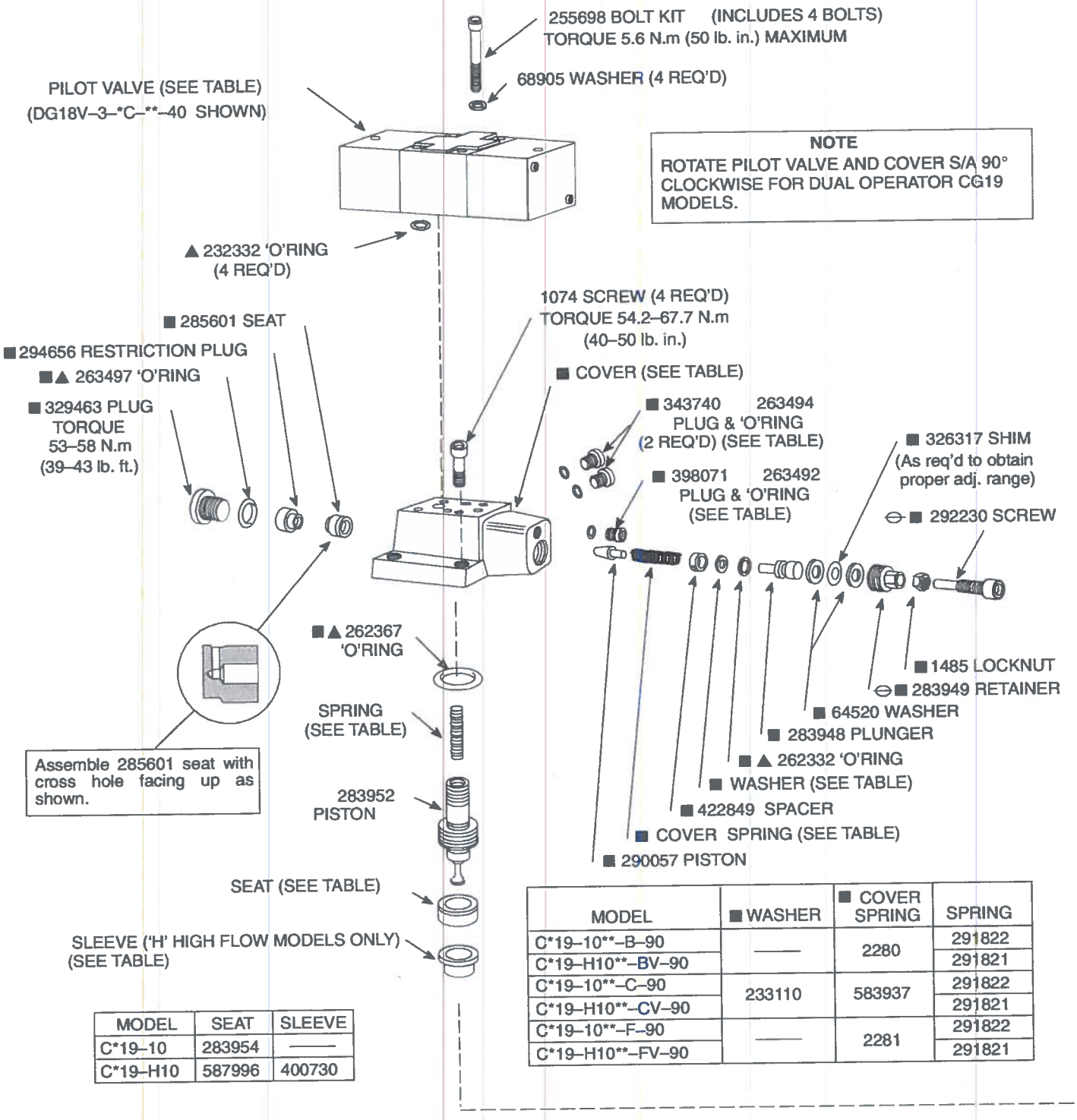
Pressure Relief

Air Controlled Relief Valve

(F3)-CG19-(H)10(P)-*(V)-(***)-90**
(F3)-CS19-(H)10(P)-*(V)-(***)-90**
(F3)-CT19-10(P)-*-(***)-90**

VICKERS
Released 09-01-87

I-3429-S



MODEL	SEAT	SLEEVE
C*19–10	283954	——
C*19–H10	587996	400730

MODEL	■ WASHER	■ COVER SPRING	SPRING
C*19–10**–B–90	——	2280	291822
C*19–H10**–BV–90			291821
C*19–10**–C–90	233110	583937	291822
C*19–H10**–CV–90			291821
C*19–10**–F–90	——	2281	291822
C*19–H10**–FV–90			291821

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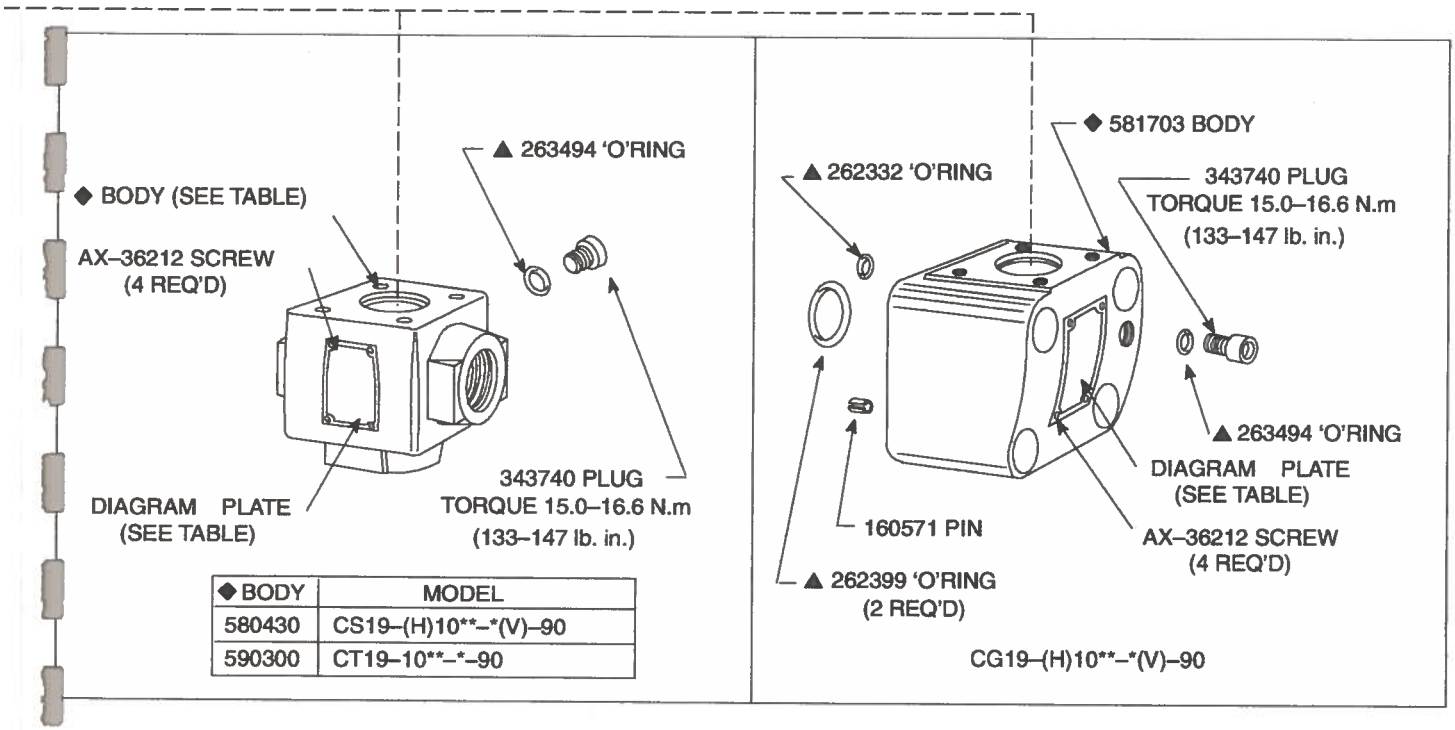
MODEL	DIAGRAM PLATE	PILOT VALVE	PILOT VALVE PARTS DRWG.
C*19–(H)100A(P)–*(V)–90	422864	DG18V–3–0BL–**–40	I–3616–S
C*19–(H)101A(P)–*(V)–90	422865	DG18V–3–2AL–**–40	
C*19–(H)102A(P)–*(V)–90	423814	DG18V–3–2BL–**–40	
C*19–(H)100C–*(V)–90	422862	DG18V–3–0C–**–40	
C*19–(H)102C–*(V)–90	422863	DG18V–3–2C–**–40	
C*19–(H)100F(P)–*(V)–90	———	DG18V–3–0FL–**–40	

MODEL	■ COVER S/A
C*19–(H)100A/F–B(V)–90	942456
C*19–(H)100A/F–C(V)–90	942457
C*19–(H)100A/F–F(V)–90	942458
C*19–(H)101A–B(V)–90	942459
C*19–(H)102A–B(V)–90	
C*19–(H)10*C–B(V)–90	
C*19–(H)101A–C(V)–90	942460
C*19–(H)102A–C(V)–90	
C*19–(H)10*C–C(V)–90	
C*19–(H)101A–F(V)–90	942461
C*19–(H)102A–F(V)–90	
C*19–(H)10*C–F(V)–90	

MODEL	■ COVER	■ PLUG/'O'RING (2 REQ'D)	■ PLUG/'O'RING
C*19–(H)100A–90	422852	———	———
C*19–(H)101A–90	424204	343740/▲263494	398071/▲263492
C*19–(H)102A–90			
C*19–(H)10*C–90			

NOTE
PARTS PREFIXED WITH A SYMBOL ARE AVAILABLE ONLY IN KITS.

■ INCLUDED IN COVER S/A
▲INCLUDED IN F3 SEAL KIT 920346 (INCLUDES PILOT VALVE SEALS)
⊖ LUBRICATE WITH OIL BEFORE ASSEMBLY
◆ NOT AVAILABLE FOR SALE


◆ BODY (SEE TABLE)
AX–36212 SCREW (4 REQ'D)
▲ 263494 'O'RING
DIAGRAM PLATE (SEE TABLE)
343740 PLUG TORQUE 15.0–16.6 N.m (133–147 lb. in.)
◆ 581703 BODY
▲ 262332 'O'RING
343740 PLUG TORQUE 15.0–16.6 N.m (133–147 lb. in.)
▲ 263494 'O'RING
DIAGRAM PLATE (SEE TABLE)
160571 PIN
AX–36212 SCREW (4 REQ'D)
▲ 262399 'O'RING (2 REQ'D)
CG19–(H)10**–*(V)–90

◆ BODY	MODEL
580430	CS19–(H)10**–*(V)–90
590300	CT19–10**–*–90

Model Code

(F3) – C * 19 – (H) 10 * * (P) – * (V) – (***) – 90

1 2 3 4 5 6 7 8 9 10 11 12 13

1 Seals for Mineral Oil & Fire Resistant Fluids (Omit if not Required)

2 Relief Valve

3 Connections

G – Subplate Mounting
S – Straight Threads
T – NPTF Threads

4 Air Controlled, Pilot Operated

5 High Flow
CG & CS Models Only
(Omit if not Required)

6 Valve Size
1-1/4 inch

7 Pilot Valve Spool Type

8 Pilot Valve Function

A – Spring Offset (Single Operator)
B – Spring Centered (Operator 'A' Removed)
C – Spring Centered (Dual Operator)
F – Spring Offset (Pressurize to Center)

9 Manual Operator Option in End Cap for Single Operator Models Only
(Omit if not Required)

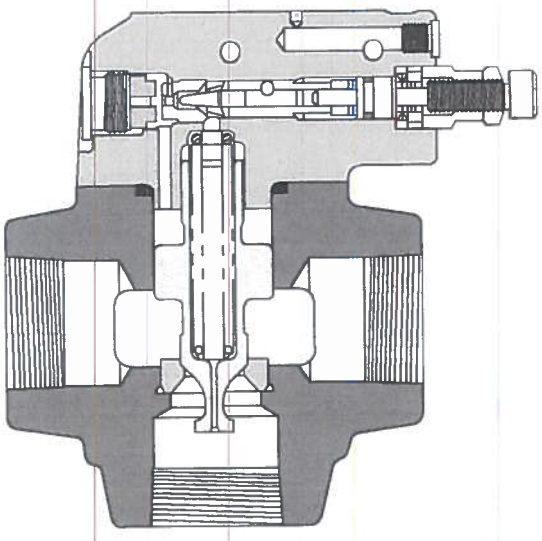
10 Pressure Range

B – 125–1000 psi
C – 500–2000 psi
F – 1500–3000 psi

11 High Vent
(Omit if not Required)

12 Pilot Valve Port Orifices
(Omit if not Required)

13 Design



RELIEF VALVE SECTIONAL VIEW WITHOUT PILOT VALVE

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP, OFR and OFRS filter series are recommended.

Litho in U.S.A.

Service Data

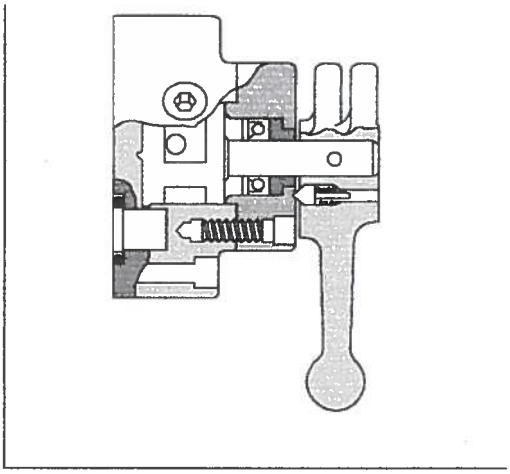
Vickers®

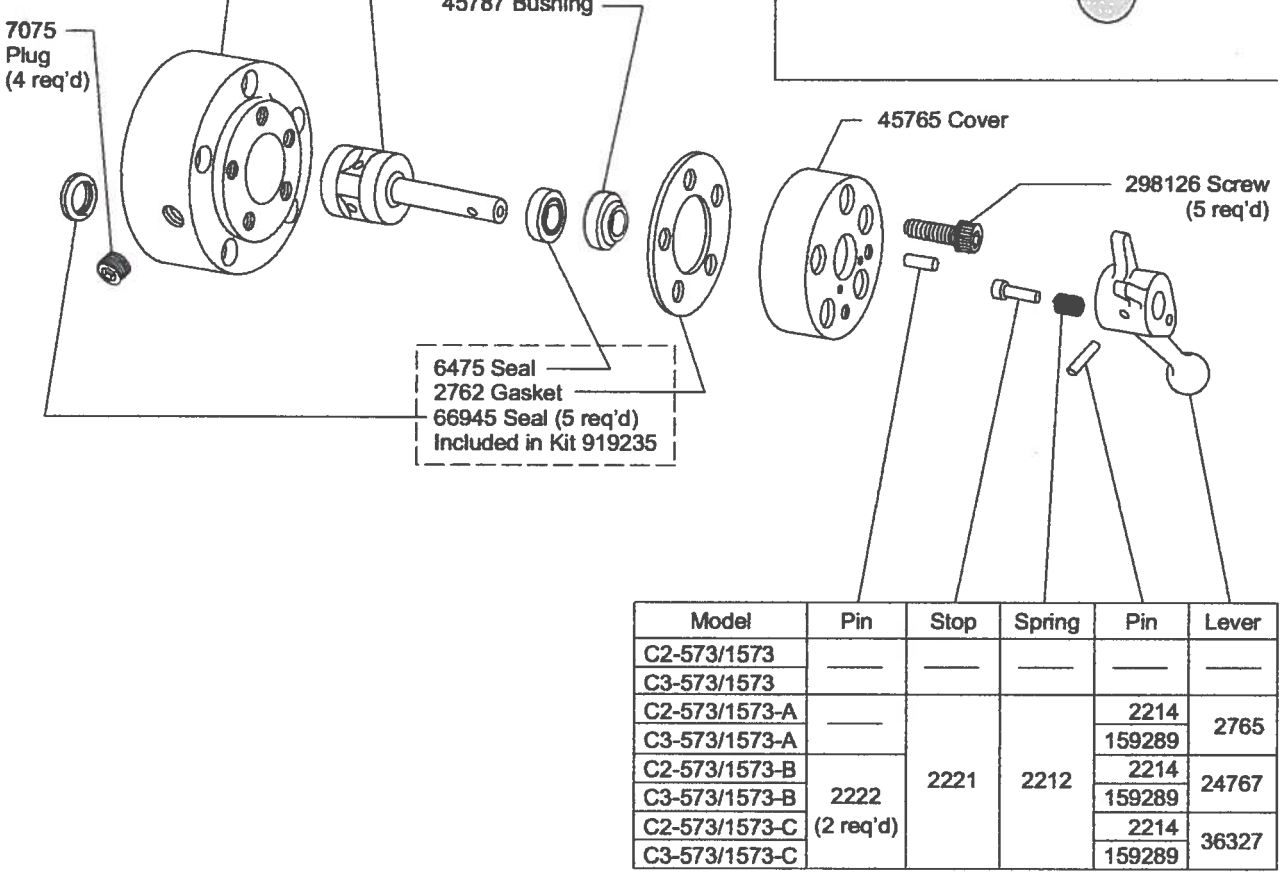
Directional Controls

Gasket Mounted Rotary Type Pilot Valves

C2-573 and C2-1573 Series
C3-573 and C3-1573 Series

Model	Body	Spool
C2-573-*	104396	45770
C3-573-*	247176	
C2-1573-*	104397	45779
C3-1573-*	261104	





Model	Pin	Stop	Spring	Pin	Lever
C2-573/1573	——	——	——	——	——
C3-573/1573					
C2-573/1573-A	——	2221	2212	2214	2765
C3-573/1573-A				159289	
C2-573/1573-B	2222 (2 req'd)			2214	24767
C3-573/1573-B				159289	
C2-573/1573-C				2214	36327
C3-573/1573-C				159289	

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Vickers OFP, OFR and OFRS filter series are recommended.

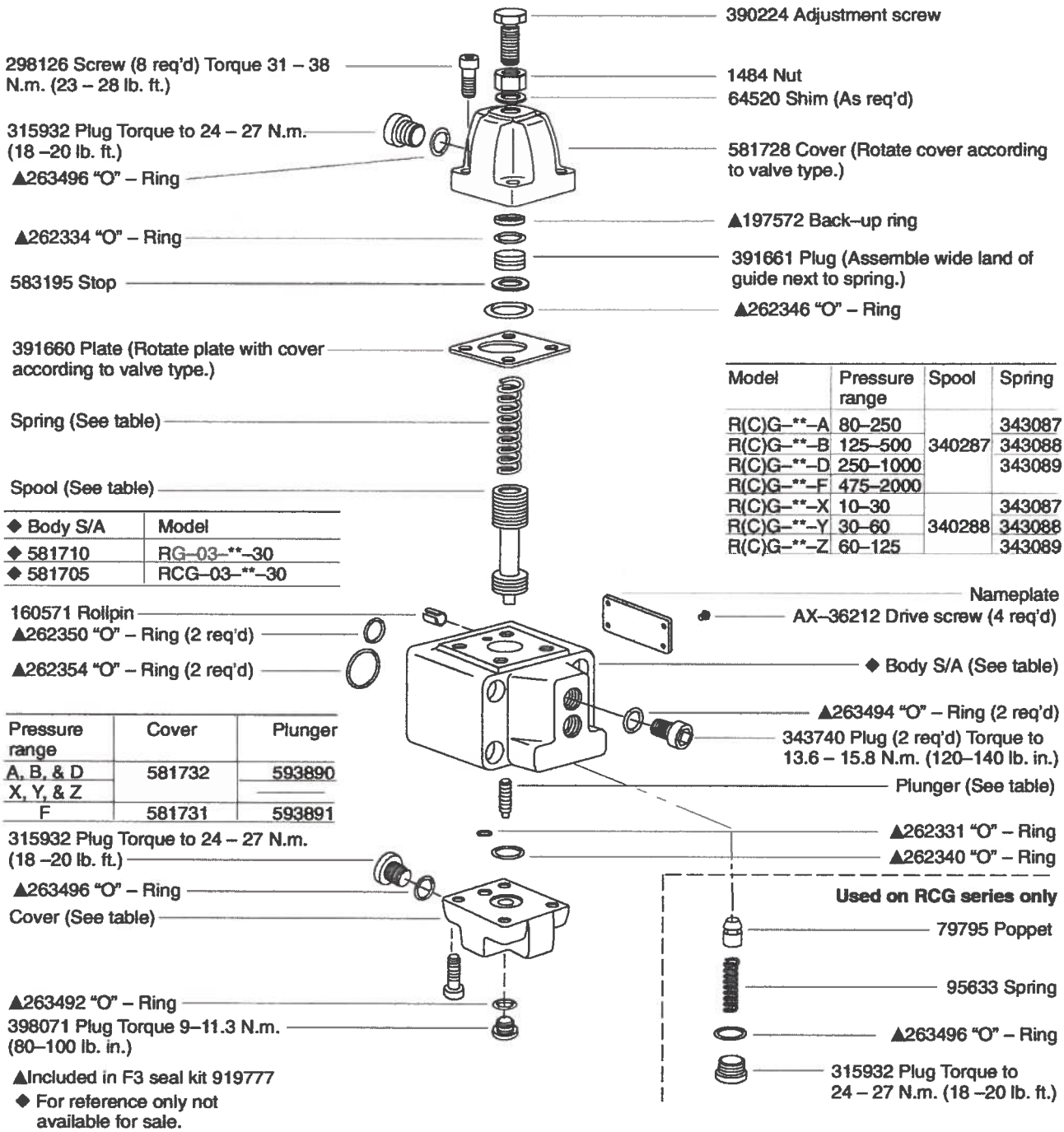
Vickers®

Directional Controls

Service Data

Pressure Control Valves

R(C)G–03–**–30 Series


390224 Adjustment screw
298126 Screw (8 req'd) Torque 31 – 38 N.m. (23 – 28 lb. ft.)
1484 Nut
64520 Shim (As req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
581728 Cover (Rotate cover according to valve type.)
▲263496 "O" – Ring
▲197572 Back–up ring
▲262334 "O" – Ring
391661 Plug (Assemble wide land of guide next to spring.)
583195 Stop
▲262346 "O" – Ring
391660 Plate (Rotate plate with cover according to valve type.)
Spring (See table)
Spool (See table)
Nameplate
160571 Rollpin
AX–36212 Drive screw (4 req'd)
▲262350 "O" – Ring (2 req'd)
◆ Body S/A (See table)
▲262354 "O" – Ring (2 req'd)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Plunger (See table)
▲262331 "O" – Ring
▲262340 "O" – Ring
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263496 "O" – Ring
Cover (See table)
Used on RCG series only
79795 Poppet
95633 Spring
▲263496 "O" – Ring
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263492 "O" – Ring
398071 Plug Torque 9–11.3 N.m. (80–100 lb. in.)

◆ Body S/A	Model
◆ 581710	RG–03–**–30
◆ 581705	RCG–03–**–30

Model	Pressure range	Spool	Spring
R(C)G–**–A	80–250		343087
R(C)G–**–B	125–500	340287	343088
R(C)G–**–D	250–1000		343089
R(C)G–**–F	475–2000		
R(C)G–**–X	10–30		343087
R(C)G–**–Y	30–60	340288	343088
R(C)G–**–Z	60–125		343089

Pressure range	Cover	Plunger
A, B, & D	581732	593890
X, Y, & Z		
F	581731	593891

▲Included in F3 seal kit 919777

◆ For reference only not available for sale.

Model Code

(F3) - R (C) G - 03 - ** - 30

1 2 3 4 5 6 7 8

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omit – No check valve

4 Mounting
Manifold or Subplate

5 Nominal valve size
03 – $^{3}/_{8}$"

6 Pressure range
A – 250 PSI max.
B – 500 PSI max.
D – 1000 PSI max.
F – 2000 PSI max.
X – 30 PSI max.
Y – 60 PSI max.
Z – 125 PSI max.

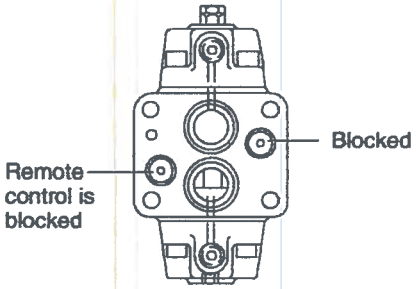
7 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

8 Design

Typical model number
RCG–03–D4–30

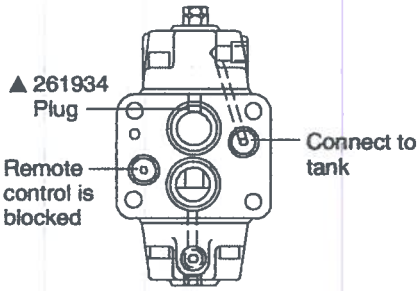
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RG series – Back pressure valve
RCG series – Counterbalance valve
Directly controlled internal drain

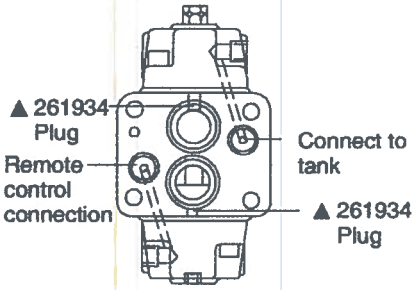


Note
Assemble covers as shown to obtain valve action desired.

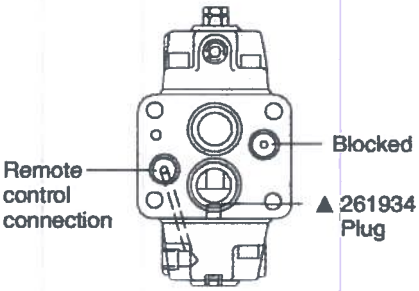
Type 2
RG or RCG series – Sequence valves
Directly controlled external drain



Type 3
RG or RCG series – Sequence valves
Remotely controlled external drain



Type 4
RG series – Unloading valve
RCG series – Counterbalance valve
Remotely controlled internal drain



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Service Data

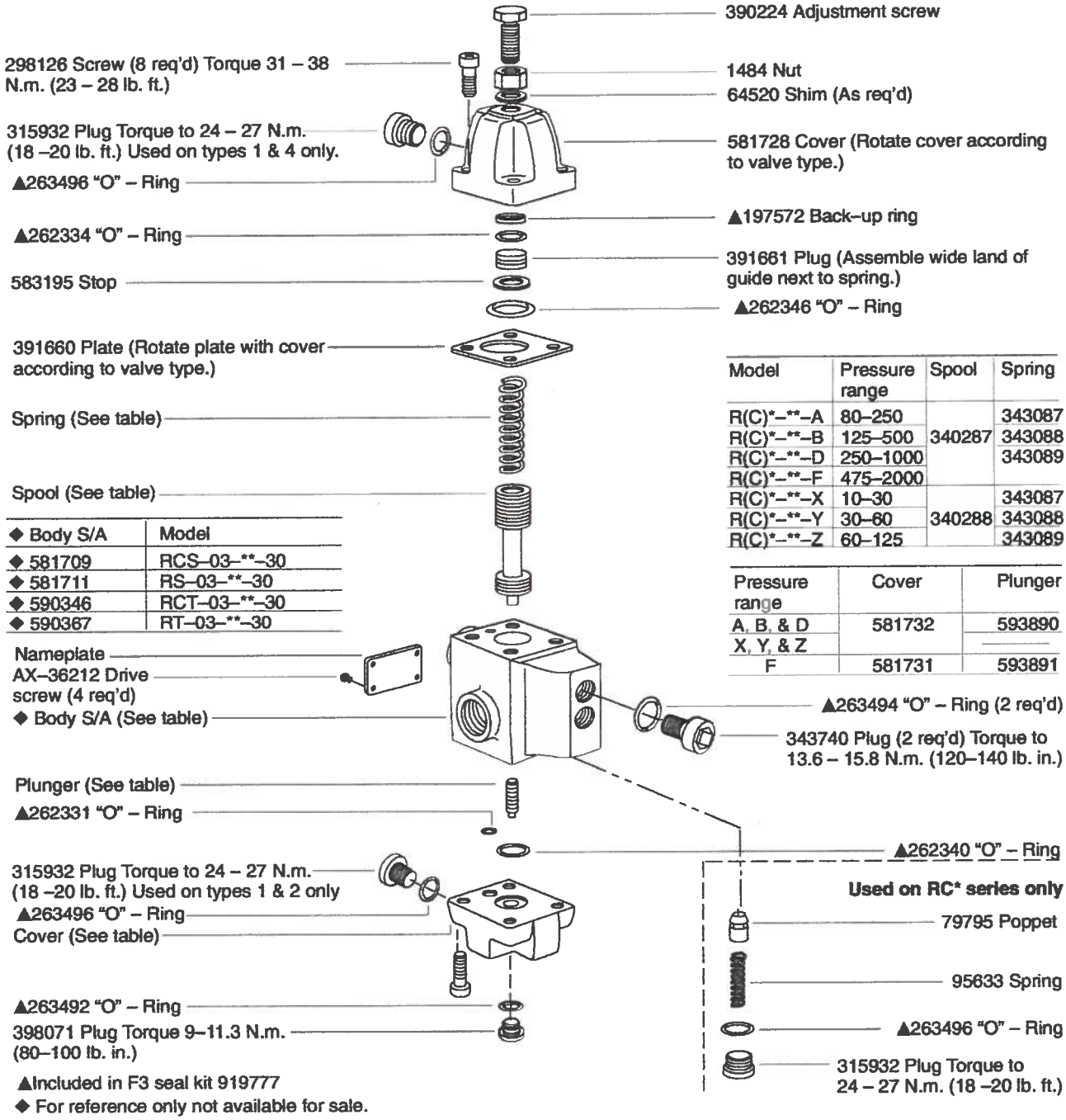
Vickers®

Pressure Relief

EATON

Pressure Control Valves

R(C)T–03––30**
R(C)S–03––30**


390224 Adjustment screw
298126 Screw (8 req'd) Torque 31 – 38 N.m. (23 – 28 lb. ft.)
1484 Nut
64520 Shim (As req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 4 only.
581728 Cover (Rotate cover according to valve type.)
▲263496 "O" – Ring
▲197572 Back–up ring
▲262334 "O" – Ring
391661 Plug (Assemble wide land of guide next to spring.)
583195 Stop
▲262346 "O" – Ring
391660 Plate (Rotate plate with cover according to valve type.)
Spring (See table)
Spool (See table)
Nameplate
AX–36212 Drive screw (4 req'd)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Plunger (See table)
▲262331 "O" – Ring
▲262340 "O" – Ring
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 2 only
▲263496 "O" – Ring
Cover (See table)
Used on RC* series only
79795 Poppet
95633 Spring
▲263496 "O" – Ring
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263492 "O" – Ring
398071 Plug Torque 9–11.3 N.m. (80–100 lb. in.)

Model	Pressure range	Spool	Spring
R(C)*–**–A	80–250	340287	343087
R(C)*–**–B	125–500		343088
R(C)*–**–D	250–1000		343089
R(C)*–**–F	475–2000		
R(C)*–**–X	10–30	340288	343087
R(C)*–**–Y	30–60		343088
R(C)*–**–Z	60–125		343089

◆ Body S/A	Model
◆ 581709	RCS–03–**–30
◆ 581711	RS–03–**–30
◆ 590346	RCT–03–**–30
◆ 590367	RT–03–**–30

Pressure range	Cover	Plunger
A, B, & D	581732	593890
X, Y, & Z		
F	581731	593891

▲Included in F3 seal kit 919777
◆ For reference only not available for sale.

VICKERS

Model Code

(F3) - R (C) * - 03 - * * - 30

1 2 3 4 5 6 7 8

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omit – No check valve

4 Mounting
S – .750–16 UNF–2B thread
T – $^3/_8$" NPTF thread

5 Connection size
03 – $^3/_8$"

6 Pressure range
A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI
X – 10 – 30 PSI
Y – 30 – 60 PSI
Z – 60 – 125 PSI

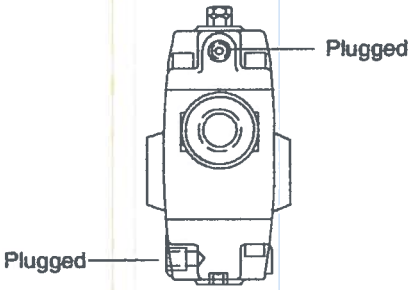
7 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

8 Design

Typical model number
RCG–03–D4–30

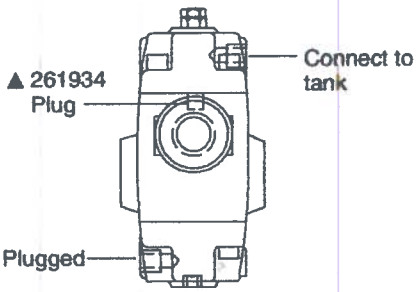
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RT series – Back pressure valve
RCT series – Counterbalance valve
Directly controlled internal drain

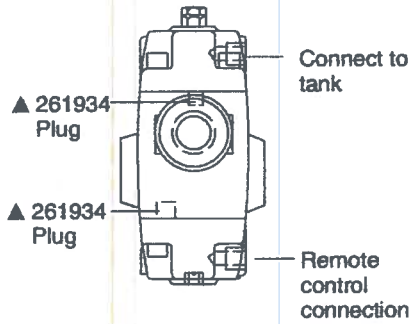


Note
Assemble covers as shown to obtain valve action desired.

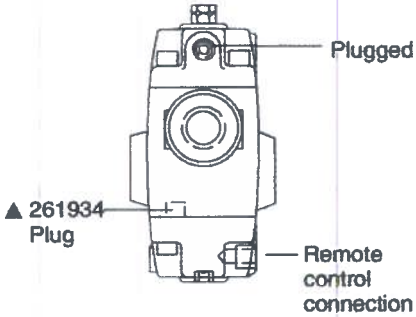
Type 2
RT or RCT series – Sequence valves
Directly controlled external drain



Type 3
RT or RCT series – Sequence valves
Remotely controlled external drain



Type 4
RT series – Unloading valve
RCT series – Counterbalance valve
Remotely controlled internal drain



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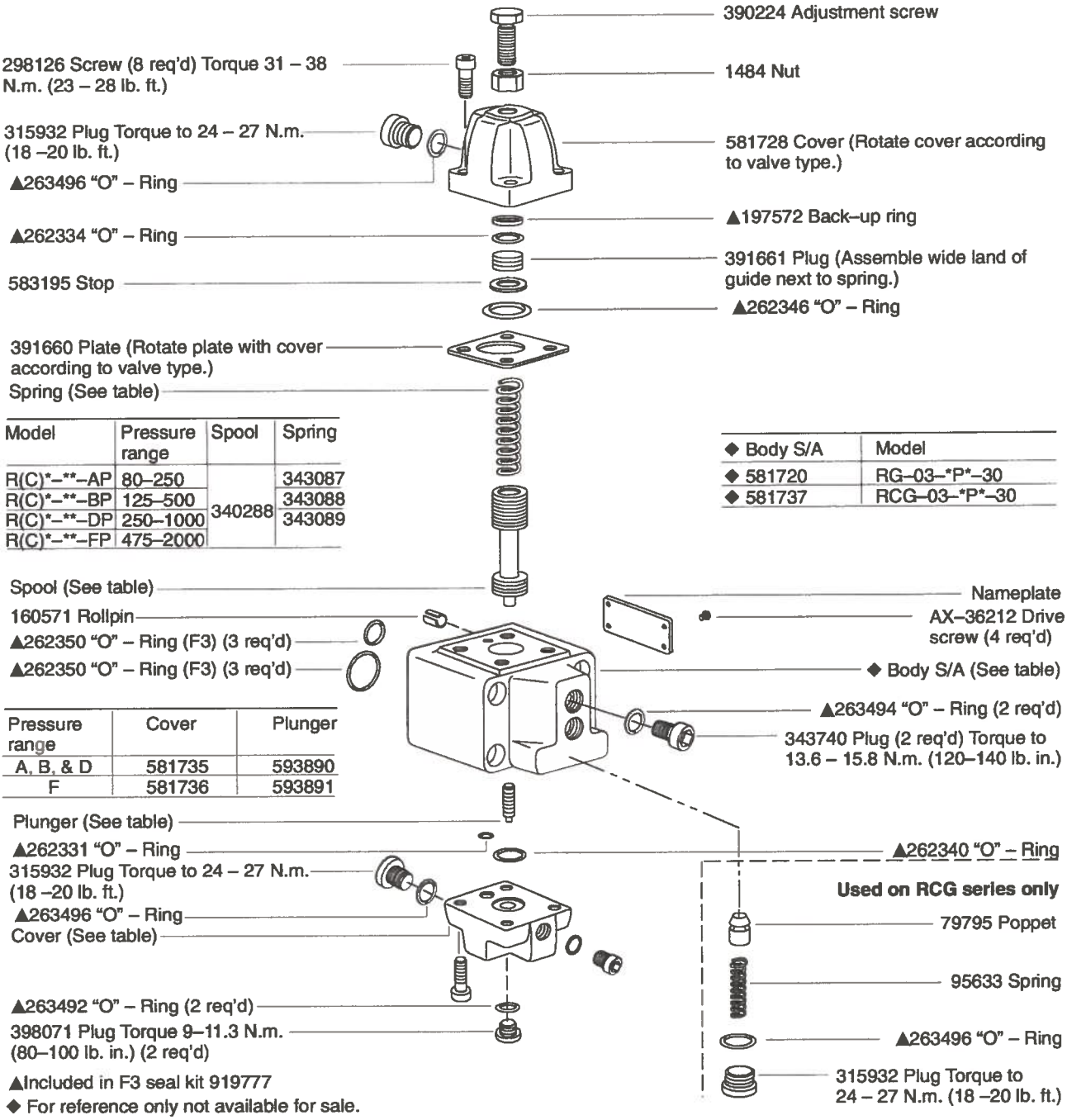
Service Data

Vickers®

Directional Controls

Pressure Control Valves

R(C)G–03–*P*–30


390224 Adjustment screw
298126 Screw (8 req'd) Torque 31 – 38 N.m. (23 – 28 lb. ft.)
1484 Nut
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
581728 Cover (Rotate cover according to valve type.)
▲263496 "O" – Ring
▲197572 Back–up ring
▲262334 "O" – Ring
391661 Plug (Assemble wide land of guide next to spring.)
583195 Stop
▲262346 "O" – Ring
391660 Plate (Rotate plate with cover according to valve type.)
Spring (See table)
Spool (See table)
Nameplate
160571 Rollpin
AX–36212 Drive screw (4 req'd)
▲262350 "O" – Ring (F3) (3 req'd)
◆ Body S/A (See table)
▲262350 "O" – Ring (F3) (3 req'd)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Plunger (See table)
▲262331 "O" – Ring
▲262340 "O" – Ring
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
Used on RCG series only
▲263496 "O" – Ring
Cover (See table)
79795 Poppet
95633 Spring
▲263492 "O" – Ring (2 req'd)
▲263496 "O" – Ring
398071 Plug Torque 9–11.3 N.m. (80–100 lb. in.) (2 req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)

Model	Pressure range	Spool	Spring
R(C)*–**–AP	80–250	340288	343087
R(C)*–**–BP	125–500		343088
R(C)*–**–DP	250–1000		343089
R(C)*–**–FP	475–2000		

◆ Body S/A	Model
◆ 581720	RG–03–*P*–30
◆ 581737	RCG–03–*P*–30

Pressure range	Cover	Plunger
A, B, & D	581735	593890
F	581736	593891

▲Included in F3 seal kit 919777

◆ For reference only not available for sale.

VICKERS

Model Code

(F3) - R (C) G - 03 - * P * -30

1 2 3 4 5 6 7 8 9

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omit – No check valve

4 Mounting
Manfold or Subplate

5 Nominal valve size
03 – $^{3}/_{8}$"

6 Pressure range
A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI

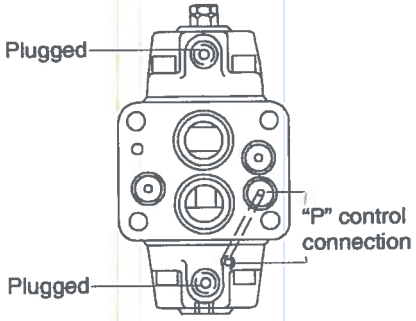
7 Auxiliary remote pressure control connection

8 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

9 Design

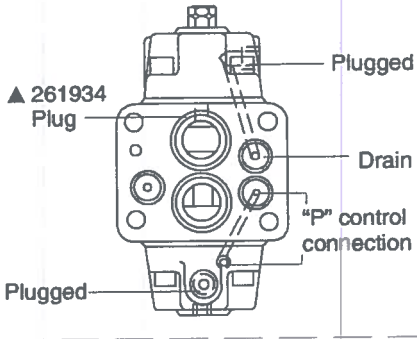
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RG series – Back pressure valve
RCG series – Counterbalance valve
Directly controlled internal drain

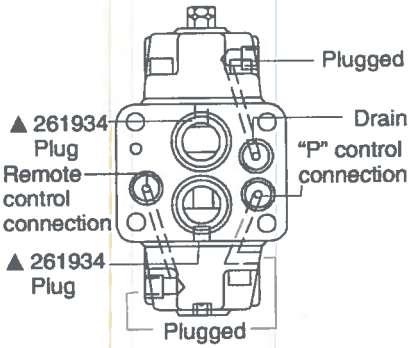


Note
Assemble covers as shown to obtain valve action desired.

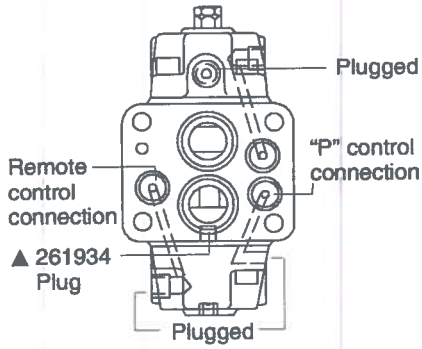
Type 2
RG or RCG series – Sequence valves
Directly controlled external drain



Type 3
RG or RCG series – Sequence valves
Remotely controlled external drain



Type 4
RG series – Unloading valve
RCG series – Counterbalance valve
Remotely controlled internal drain



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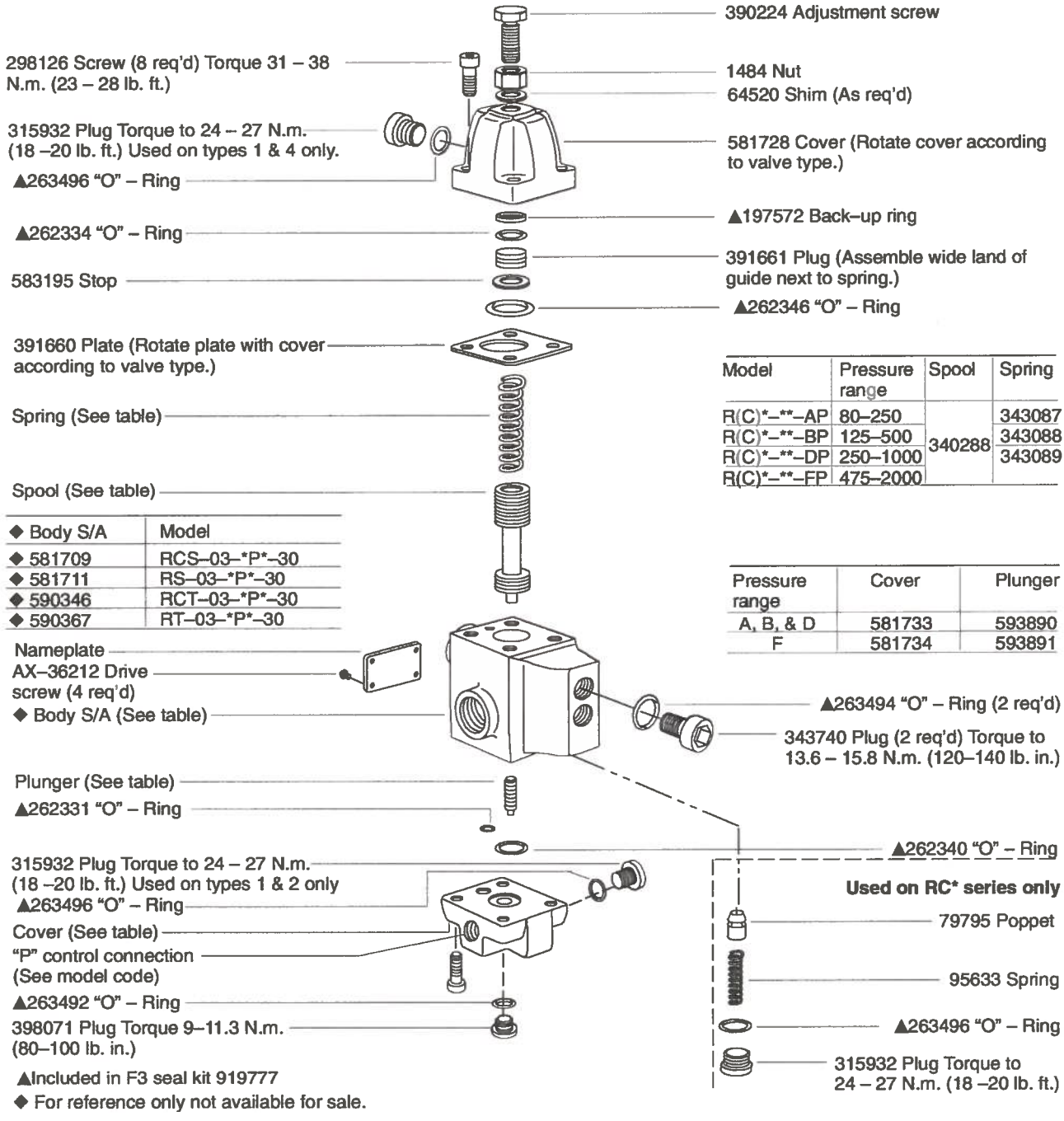
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

R(C)T–03–*P*–30
R(C)S–03–*P*–30


390224 Adjustment screw
298126 Screw (8 req'd) Torque 31 – 38 N.m. (23 – 28 lb. ft.)
1484 Nut
64520 Shim (As req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 4 only.
581728 Cover (Rotate cover according to valve type.)
▲263496 "O" – Ring
▲197572 Back–up ring
▲262334 "O" – Ring
391661 Plug (Assemble wide land of guide next to spring.)
583195 Stop
▲262346 "O" – Ring
391660 Plate (Rotate plate with cover according to valve type.)
Spring (See table)
Spool (See table)
Nameplate
AX–36212 Drive screw (4 req'd)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Plunger (See table)
▲262331 "O" – Ring
▲262340 "O" – Ring
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 2 only
▲263496 "O" – Ring
Cover (See table)
"P" control connection (See model code)
▲263492 "O" – Ring
398071 Plug Torque 9–11.3 N.m. (80–100 lb. in.)
Used on RC* series only
79795 Poppet
95633 Spring
▲263496 "O" – Ring
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)

Model	Pressure range	Spool	Spring
R(C)*–**–AP	80–250	340288	343087
R(C)*–**–BP	125–500		343088
R(C)*–**–DP	250–1000		343089
R(C)*–**–FP	475–2000		

◆ Body S/A	Model
◆ 581709	RCS–03–*P*–30
◆ 581711	RS–03–*P*–30
◆ 590346	RCT–03–*P*–30
◆ 590367	RT–03–*P*–30

Pressure range	Cover	Plunger
A, B, & D	581733	593890
F	581734	593891

▲Included in F3 seal kit 919777

◆ For reference only not available for sale.

Model Code

(F3) - R (C) * - 03 - * P * -30

1 2 3 4 5 6 7 8 9

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omit – No check valve

4 Mounting
S – .750–16 UNF–2B thread
T – 3/8" NPTF thread

5 Connection size
03 – 3/8"

6 Pressure range
A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI

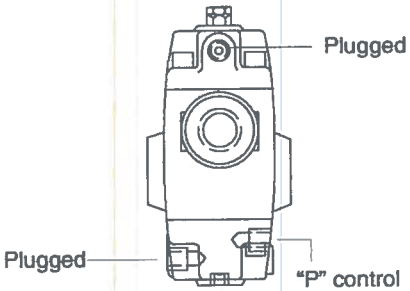
7 Auxiliary remote pressure control connection

8 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

9 Design

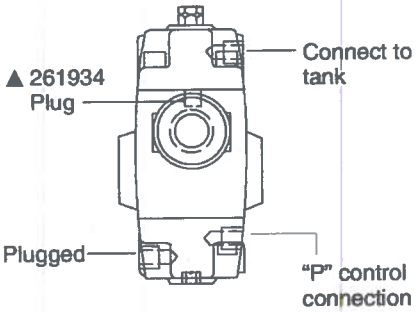
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RT series – Back pressure valve
RCT series – Counterbalance valve
Directly controlled internal drain

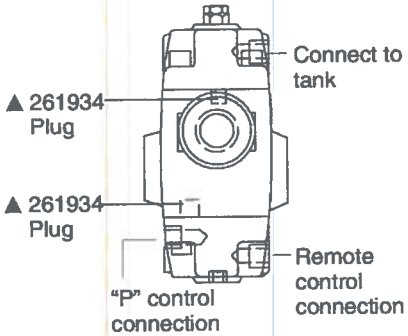


Note
Assemble covers as shown to obtain valve action desired.

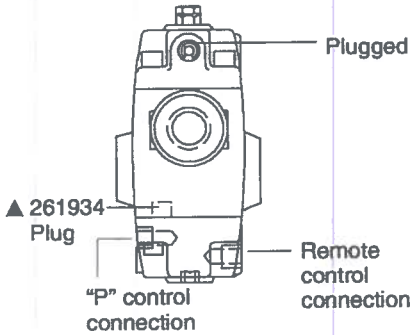
Type 2
RT or RCT series – Sequence valves
Directly controlled external drain



Type 3
RT or RCT series – Sequence valves
Remotely controlled external drain



Type 4
RT series – Unloading valve
RCT series – Counterbalance valve
Remotely controlled internal drain



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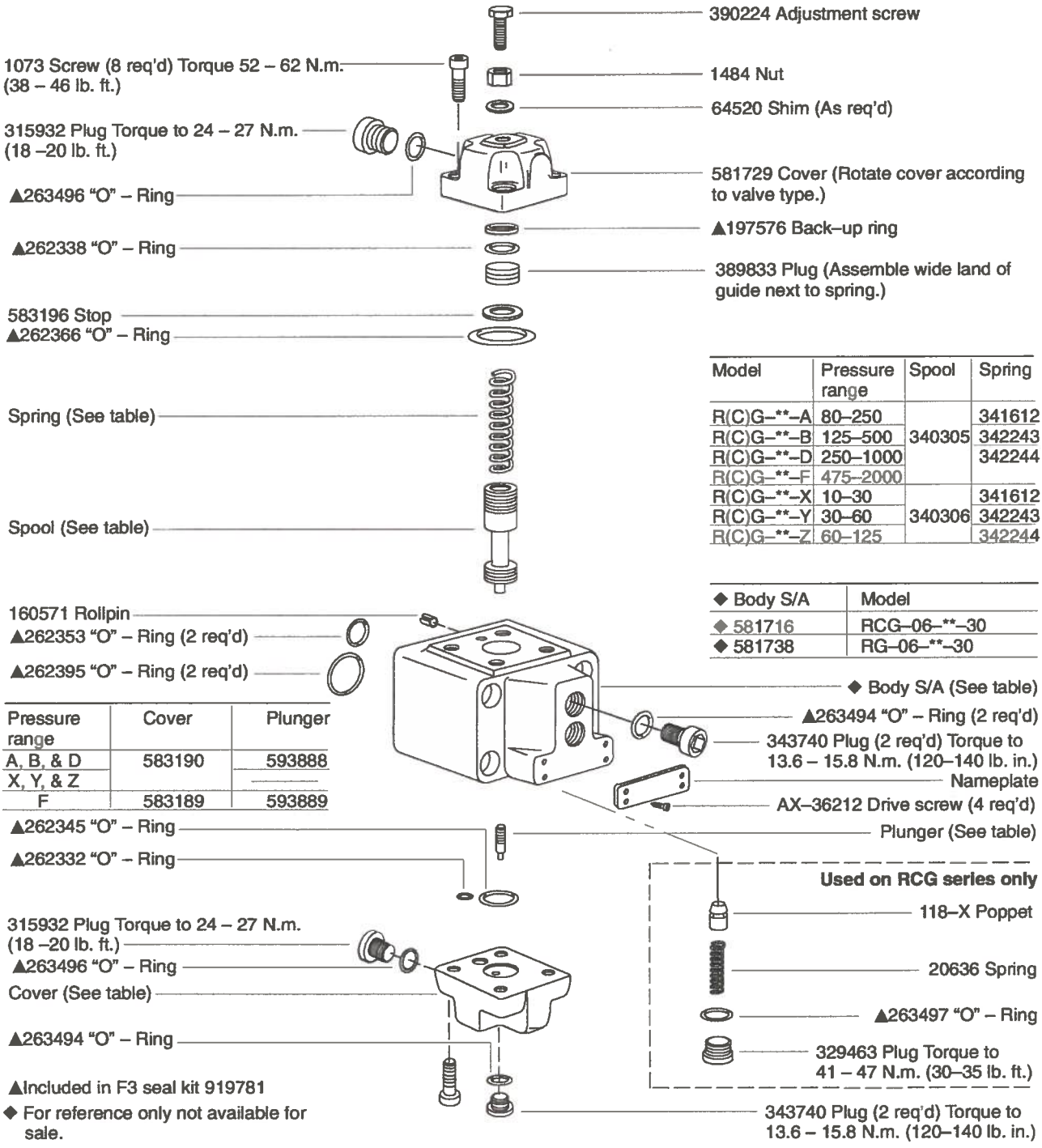
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

R(C)G–06–**–30 Series


390224 Adjustment screw
1073 Screw (8 req'd) Torque 52 – 62 N.m. (38 – 46 lb. ft.)
1484 Nut
64520 Shim (As req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
581729 Cover (Rotate cover according to valve type.)
▲263496 "O" – Ring
▲197576 Back–up ring
▲262338 "O" – Ring
389833 Plug (Assemble wide land of guide next to spring.)
583196 Stop
▲262366 "O" – Ring
Spring (See table)
Spool (See table)
160571 Rollpin
▲262353 "O" – Ring (2 req'd)
▲262395 "O" – Ring (2 req'd)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Nameplate
AX–36212 Drive screw (4 req'd)
▲262345 "O" – Ring
▲262332 "O" – Ring
Plunger (See table)
Used on RCG series only
118–X Poppet
20636 Spring
▲263497 "O" – Ring
329463 Plug Torque to 41 – 47 N.m. (30–35 lb. ft.)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263496 "O" – Ring
Cover (See table)
▲263494 "O" – Ring
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)

Model	Pressure range	Spool	Spring
R(C)G–**–A	80–250	340305	341612
R(C)G–**–B	125–500		342243
R(C)G–**–D	250–1000		342244
R(C)G–**–F	475–2000		
R(C)G–**–X	10–30	340306	341612
R(C)G–**–Y	30–60		342243
R(C)G–**–Z	60–125		342244

◆ Body S/A	Model
◆ 581716	RCG–06–**–30
◆ 581738	RG–06–**–30

Pressure range	Cover	Plunger
A, B, & D	583190	593888
X, Y, & Z		
F	583189	593889

▲Included in F3 seal kit 919781

◆ For reference only not available for sale.

Revised 09–01–96

I–3655–S

Model Code

(F3) - R (C) G - 06 - ** - 30

1 2 3 4 5 6 7 8

1 Special seals
(Omit on STD. models.)

2 Pressure actuated control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omitted – Without check valve

4 Mounting
Manifold or Subplate

5 Nominal valve size
06 – $^{3}/_{4}$"

6 Pressure range
A – 80 – 250 PSI max.
B – 125 – 500 PSI max.
D – 250 – 1000 PSI max.
F – 475 – 2000 PSI max.
X – 10 – 30 PSI max.
Y – 30 – 60 PSI max.
Z – 60 – 125 PSI max.

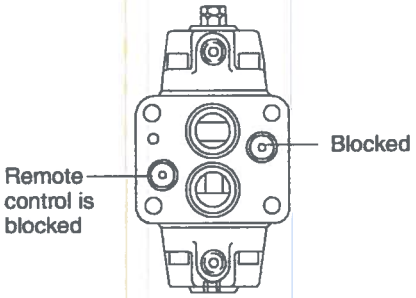
7 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

8 Design

Typical model number
RCG–06–D4–30

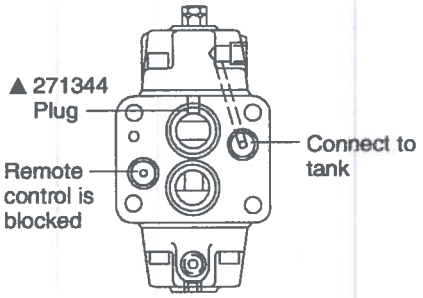
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RG series – Back pressure valve.
RCG series – Counterbalance valve.
Directly controlled internal drain

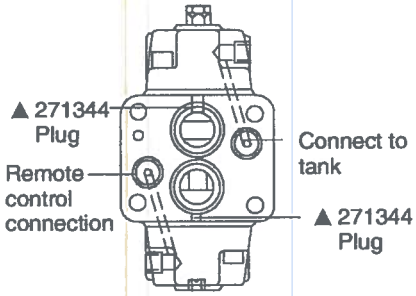


Note
Assemble covers as shown to obtain valve action desired.

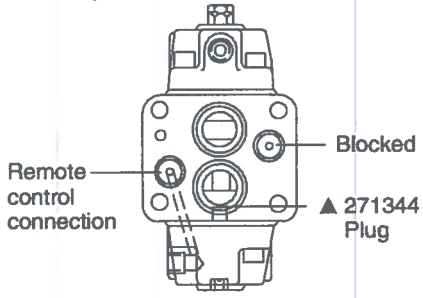
Type 2
RG or RCG series – Sequence valves.
Directly controlled external drain



Type 3
RG or RCG series – Sequence valves.
Remotely controlled external drain



Type 4
RG series – Unloading valve.
RCG series – Counterbalance valve.
Remotely controlled internal drain



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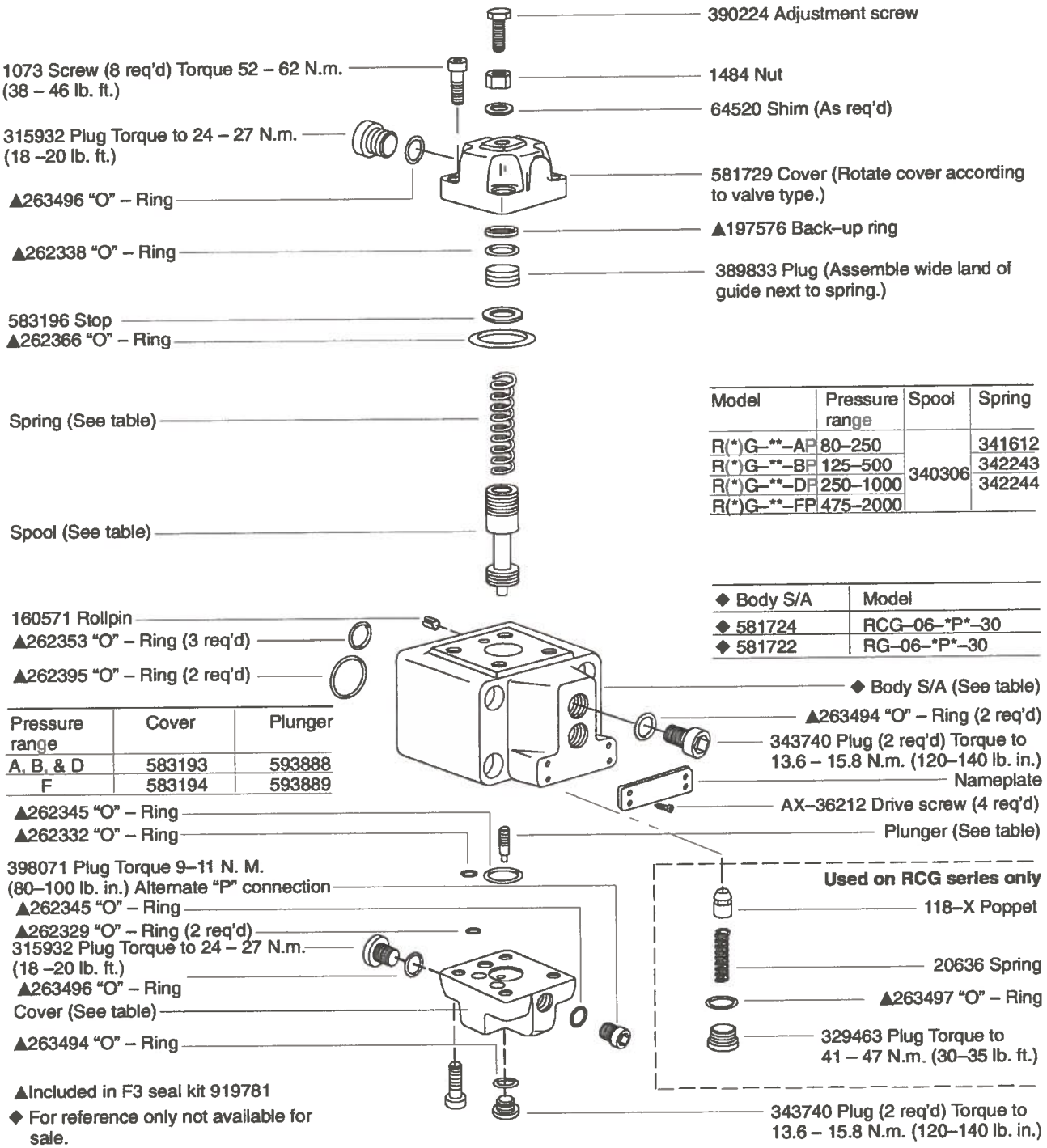
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

R(C)G–06–*P*–30 Series


390224 Adjustment screw
1073 Screw (8 req'd) Torque 52 – 62 N.m. (38 – 46 lb. ft.)
1484 Nut
64520 Shim (As req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
581729 Cover (Rotate cover according to valve type.)
▲263496 "O" – Ring
▲197576 Back–up ring
▲262338 "O" – Ring
389833 Plug (Assemble wide land of guide next to spring.)
583196 Stop
▲262366 "O" – Ring
Spring (See table)
Spool (See table)
160571 Rollpin
▲262353 "O" – Ring (3 req'd)
▲262395 "O" – Ring (2 req'd)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Nameplate
AX–36212 Drive screw (4 req'd)
▲262345 "O" – Ring
▲262332 "O" – Ring
Plunger (See table)
398071 Plug Torque 9–11 N. M. (80–100 lb. in.) Alternate "P" connection
▲262345 "O" – Ring
▲262329 "O" – Ring (2 req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263496 "O" – Ring
Cover (See table)
▲263494 "O" – Ring
Used on RCG series only
118–X Poppet
20636 Spring
▲263497 "O" – Ring
329463 Plug Torque to 41 – 47 N.m. (30–35 lb. ft.)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)

Model	Pressure range	Spool	Spring
R(*)G–**–AP	80–250	340306	341612
R(*)G–**–BP	125–500		342243
R(*)G–**–DP	250–1000		342244
R(*)G–**–FP	475–2000		

◆ Body S/A	Model
◆ 581724	RCG–06–*P*–30
◆ 581722	RG–06–*P*–30

Pressure range	Cover	Plunger
A, B, & D	583193	593888
F	583194	593889

▲Included in F3 seal kit 919781

◆ For reference only not available for sale.

VICKERS

Model Code

(F3) - R (C) G - 06 - * P * -30

1 2 3 4 5 6 7 8 9

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omit – No check valve

4 Mounting
Manifold or Subplate

5 Nominal valve size
06 – 3/4"

6 Pressure range
A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI

7 Auxiliary remote pressure control connection

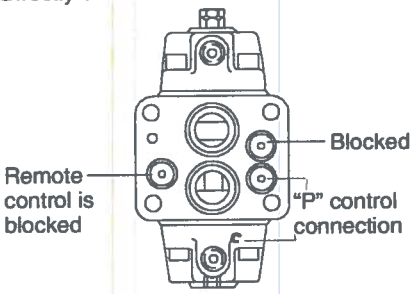
8 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

9 Design

Typical model number
RCG–06–DP4–30

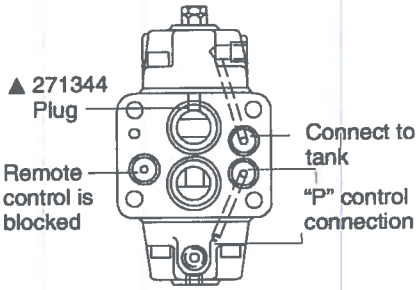
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RG series – Back pressure valve.
RCG series – Counterbalance valve.
Directly controlled internal drain

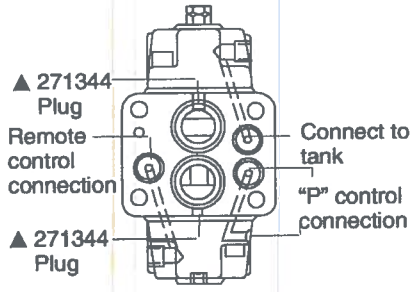


Note
Assemble covers as shown to obtain valve action desired.

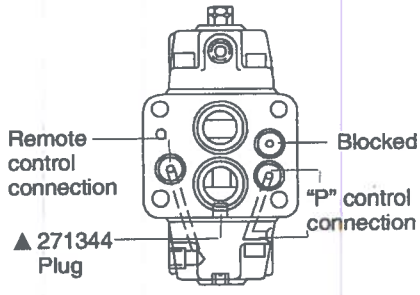
Type 2
RG or RCG series – Sequence valves.
Directly controlled external drain



Type 3
RG or RCG series – Sequence valves.
Remotely controlled external drain



Type 4
RG series – Unloading valve.
RCG series – Counterbalance valve.
Remotely controlled internal drain



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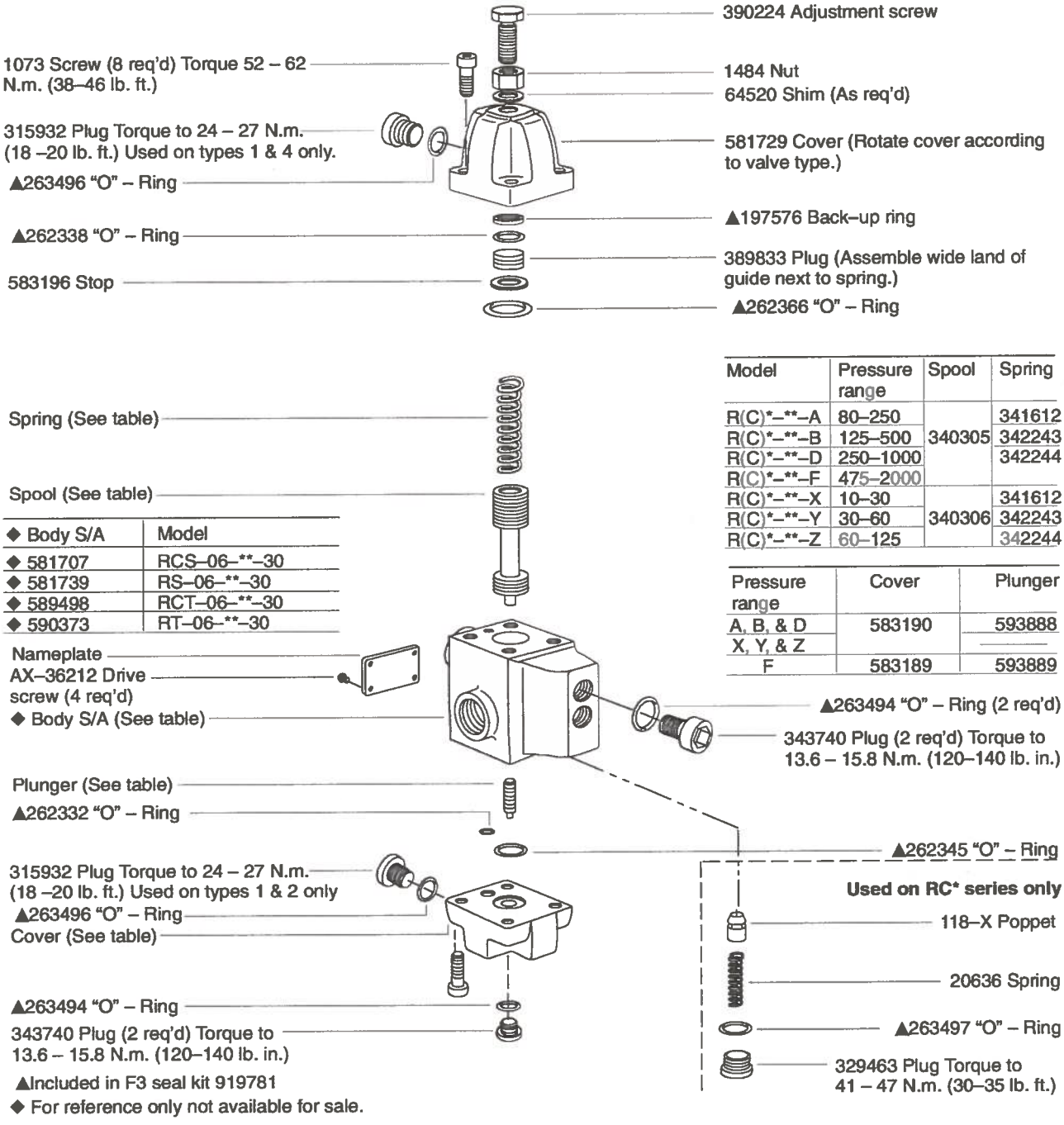
Vickers®
Valves

Service Data

Pressure Control Valves

R(C)T–06––30**
R(C)S–06––30**

EATON


390224 Adjustment screw
1073 Screw (8 req'd) Torque 52 – 62 N.m. (38–46 lb. ft.)
1484 Nut
64520 Shim (As req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 4 only.
581729 Cover (Rotate cover according to valve type.)
▲263496 "O" – Ring
▲197576 Back–up ring
▲262338 "O" – Ring
389833 Plug (Assemble wide land of guide next to spring.)
583196 Stop
▲262366 "O" – Ring
Spring (See table)
Spool (See table)
Nameplate
AX–36212 Drive screw (4 req'd)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Plunger (See table)
▲262332 "O" – Ring
▲262345 "O" – Ring
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 2 only
▲263496 "O" – Ring
Cover (See table)
Used on RC* series only
118–X Poppet
20636 Spring
▲263494 "O" – Ring
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
▲263497 "O" – Ring
329463 Plug Torque to 41 – 47 N.m. (30–35 lb. ft.)

◆ Body S/A	Model
◆ 581707	RCS–06–**–30
◆ 581739	RS–06–**–30
◆ 589498	RCT–06–**–30
◆ 590373	RT–06–**–30

Model	Pressure range	Spool	Spring
R(C)*–**–A	80–250	340305	341612
R(C)*–**–B	125–500		342243
R(C)*–**–D	250–1000		342244
R(C)*–**–F	475–2000		
R(C)*–**–X	10–30	340306	341612
R(C)*–**–Y	30–60		342243
R(C)*–**–Z	60–125		342244

Pressure range	Cover	Plunger
A, B, & D	583190	593888
X, Y, & Z		
F	583189	593889

▲Included in F3 seal kit 919781
◆ For reference only not available for sale.

VICKERS

Model Code

(F3) - R (C) ⋆ - 06 - ⋆⋆ - 30

1 2 3 4 5 6 7 8

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omit – No check valve

4 Mounting
S – 1.0625–12 UNF–2B thread
T – $^{3}/_{4}$" NPTF thread

5 Connection size
06 – $^{3}/_{4}$" Pipe thread

6 Pressure range
A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI
X – 10 – 30 PSI
Y – 30 – 60 PSI
Z – 60 – 125 PSI

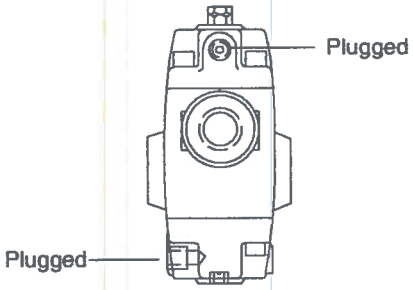
7 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

8 Design

Typical model number
RCT–06–D4–30

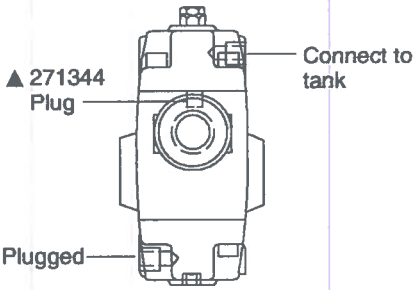
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RT series – Back pressure valve.
RCT series – Counterbalance valve.
Directly controlled internal drain

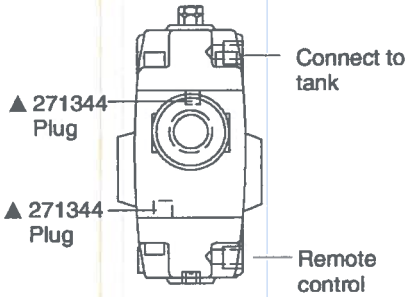


Note
Assemble covers as shown to obtain valve action desired.

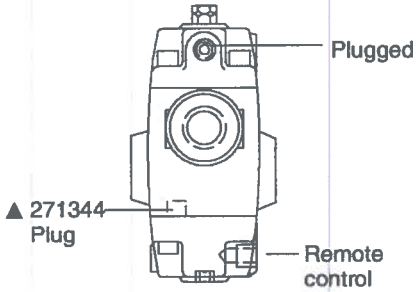
Type 2
RT or RCT series – Sequence valves.
Directly controlled external drain



Type 3
RT or RCT series – Sequence valves.
Remotely controlled external drain



Type 4
RT series – Unloading valve.
RCT series – Counterbalance valve.
Remotely controlled internal drain



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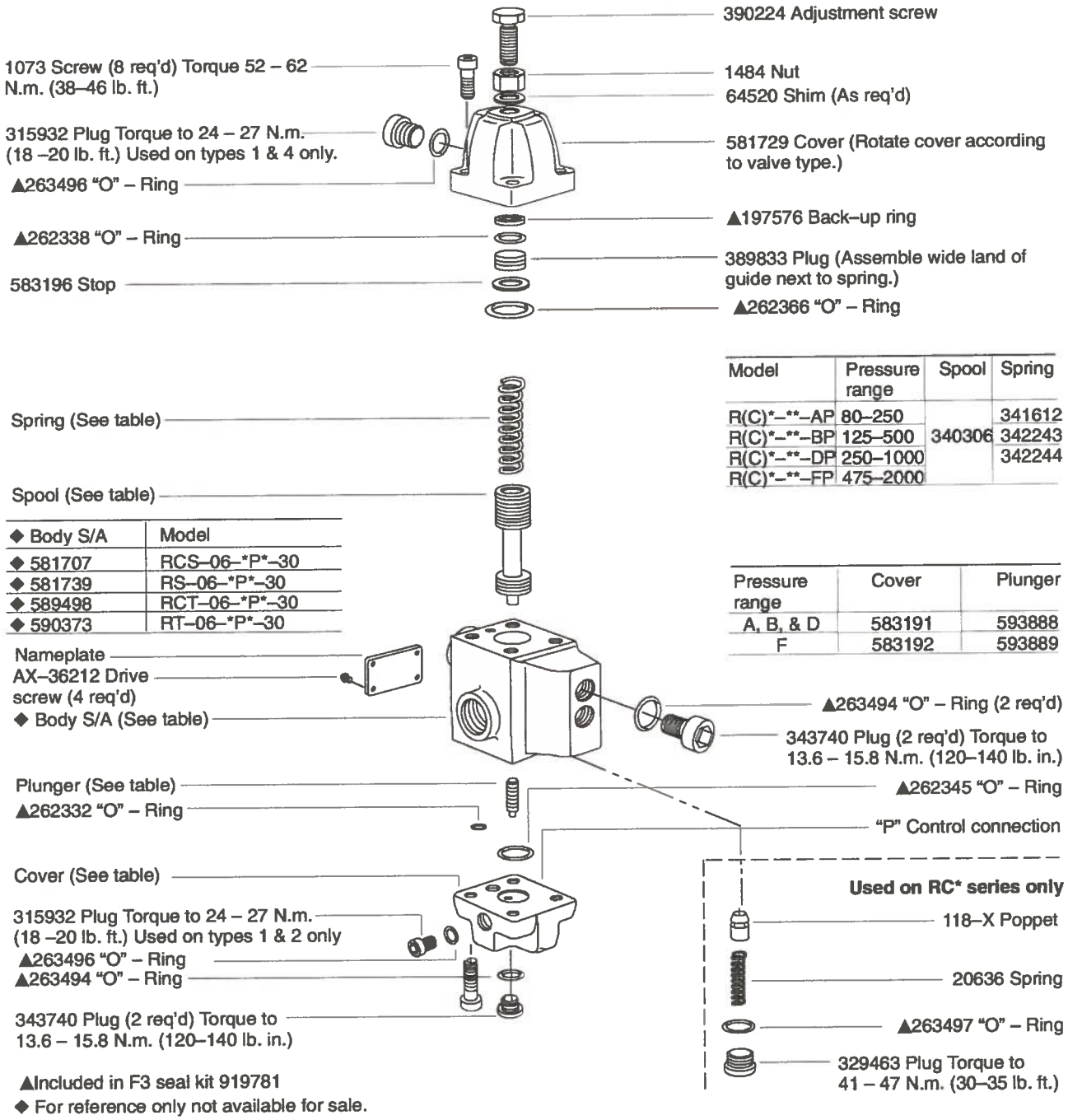
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

R(C)T–06–*P*–30
R(C)S–06–*P*–30


390224 Adjustment screw
1073 Screw (8 req'd) Torque 52 – 62 N.m. (38–46 lb. ft.)
1484 Nut
64520 Shim (As req'd)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 4 only.
581729 Cover (Rotate cover according to valve type.)
▲263496 "O" – Ring
▲197576 Back–up ring
▲262338 "O" – Ring
389833 Plug (Assemble wide land of guide next to spring.)
583196 Stop
▲262366 "O" – Ring
Spring (See table)
Spool (See table)
Nameplate
AX–36212 Drive screw (4 req'd)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Plunger (See table)
▲262332 "O" – Ring
▲262345 "O" – Ring
"P" Control connection
Cover (See table)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 2 only
▲263496 "O" – Ring
▲263494 "O" – Ring
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Used on RC* series only
118–X Poppet
20636 Spring
▲263497 "O" – Ring
329463 Plug Torque to 41 – 47 N.m. (30–35 lb. ft.)

Model	Pressure range	Spool	Spring
R(C)*–**–AP	80–250	340306	341612
R(C)*–**–BP	125–500		342243
R(C)*–**–DP	250–1000		342244
R(C)*–**–FP	475–2000		

◆ Body S/A	Model
◆ 581707	RCS–06–*P*–30
◆ 581739	RS–06–*P*–30
◆ 589498	RCT–06–*P*–30
◆ 590373	RT–06–*P*–30

Pressure range	Cover	Plunger
A, B, & D	583191	593888
F	583192	593889

▲Included in F3 seal kit 919781
◆ For reference only not available for sale.

Model Code

(F3) - R (C) G - 06 - * P * -30

1 2 3 4 5 6 7 8 9

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omit – No check valve

4 Mounting
S – 1.0625–12 UNF–2B thread
T – $^{3}/_{4}$" NPTF thread

5 Nominal valve size
06 – $^{3}/_{4}$" Pipe thread

6 Pressure range
A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI

7 Auxiliary remote pressure control connection

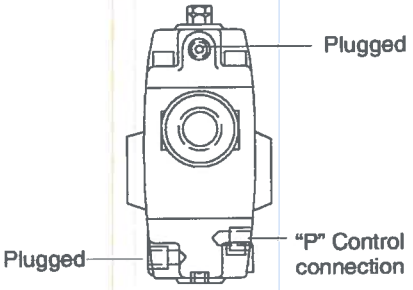
8 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

9 Design

Typical model number
RCG–06–DP4–30

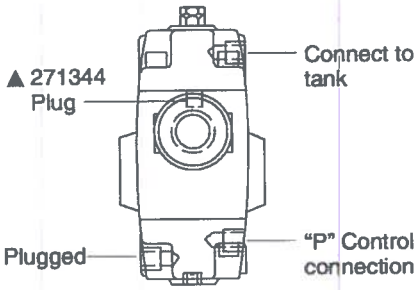
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RT series – Back pressure valve.
RCT series – Counterbalance valve.
Directly controlled internal drain

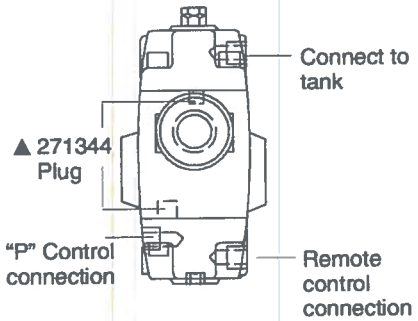


Note
Assemble covers as shown to obtain valve action desired.

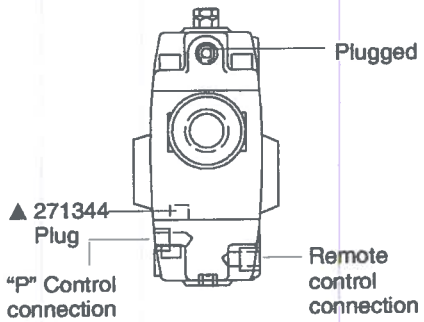
Type 2
RT or RCT series – Sequence valves.
Directly controlled external drain



Type 3
RT or RCT series – Sequence valves.
Remotely controlled external drain



Type 4
RT series – Unloading valve.
RCT series – Counterbalance valve.
Remotely controlled internal drain



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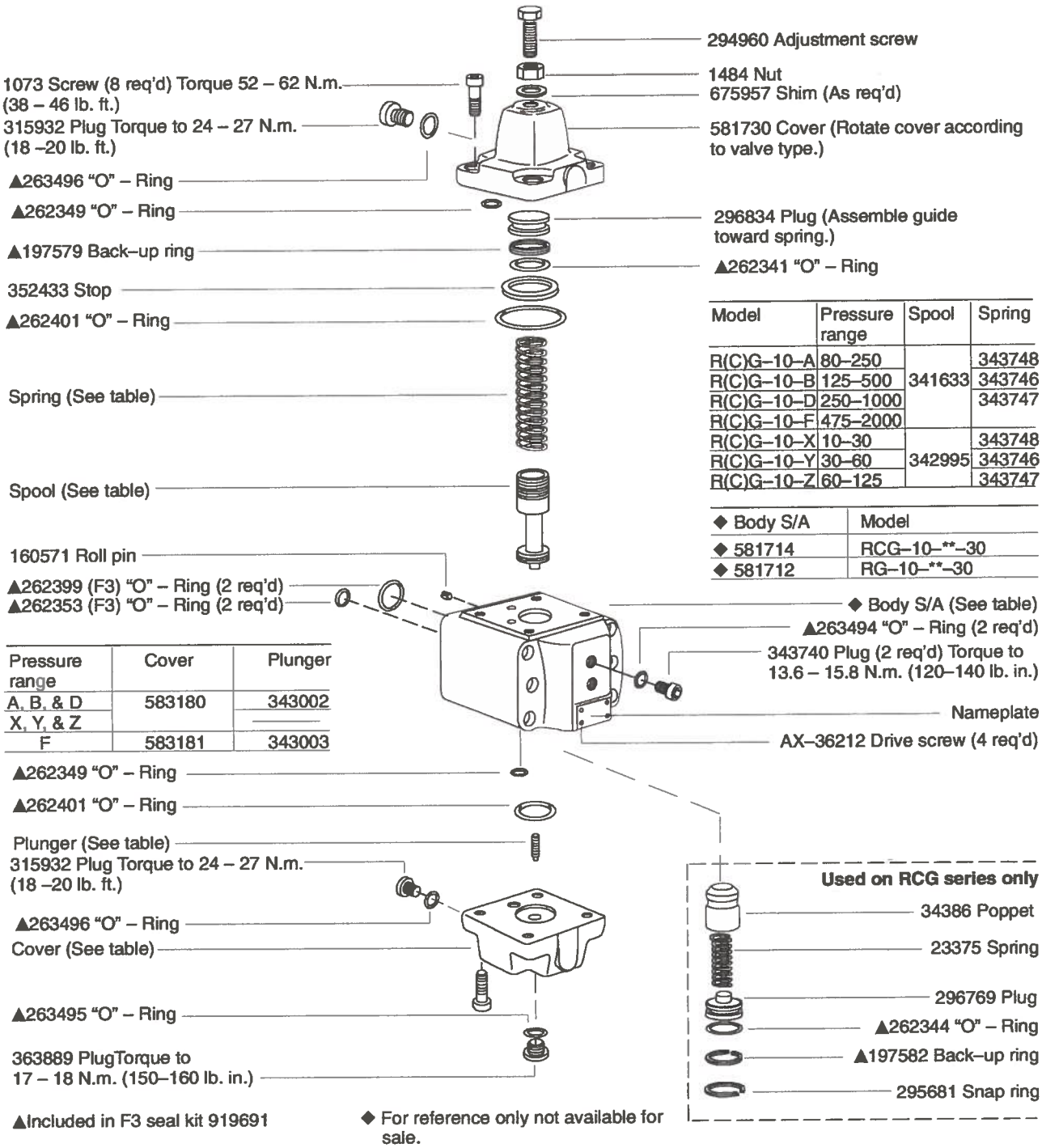
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

(F3)R(C)G–10–**–30 Series


294960 Adjustment screw
1484 Nut
675957 Shim (As req'd)
581730 Cover (Rotate cover according to valve type.)
1073 Screw (8 req'd) Torque 52 – 62 N.m. (38 – 46 lb. ft.)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263496 "O" – Ring
▲262349 "O" – Ring
296834 Plug (Assemble guide toward spring.)
▲197579 Back–up ring
▲262341 "O" – Ring
352433 Stop
▲262401 "O" – Ring
Spring (See table)
Spool (See table)
160571 Roll pin
▲262399 (F3) "O" – Ring (2 req'd)
▲262353 (F3) "O" – Ring (2 req'd)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Nameplate
AX–36212 Drive screw (4 req'd)
▲262349 "O" – Ring
▲262401 "O" – Ring
Plunger (See table)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263496 "O" – Ring
Cover (See table)
▲263495 "O" – Ring
363889 PlugTorque to 17 – 18 N.m. (150–160 lb. in.)
Used on RCG series only
34386 Poppet
23375 Spring
296769 Plug
▲262344 "O" – Ring
▲197582 Back–up ring
295681 Snap ring

Model	Pressure range	Spool	Spring
R(C)G–10–A	80–250	341633	343748
R(C)G–10–B	125–500		343746
R(C)G–10–D	250–1000		343747
R(C)G–10–F	475–2000		
R(C)G–10–X	10–30	342995	343748
R(C)G–10–Y	30–60		343746
R(C)G–10–Z	60–125		343747

◆ Body S/A	Model
◆ 581714	RCG–10–**–30
◆ 581712	RG–10–**–30

Pressure range	Cover	Plunger
A, B, & D	583180	343002
X, Y, & Z		
F	583181	343003

▲Included in F3 seal kit 919691

◆ For reference only not available for sale.

Model Code

(F3) - R (C) G - 10 - ** - 3*

1 2 3 4 5 6 7 8

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omitted – Without check valve

4 Mounting
Manifold or Subplate

5 Nominal valve size
10 – 1 1/4"

6 Pressure range
A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI
X – 10 – 30 PSI
Y – 30 – 60 PSI
Z – 60 – 125 PSI

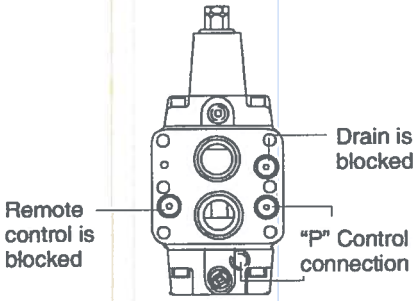
7 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

8 Design

Typical model number
RCG–10–D4–30

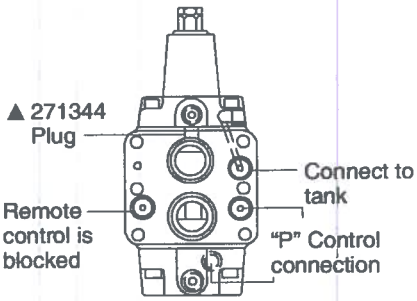
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RG series – Back pressure valve.
RCG series – Counterbalance valve.
Directly controlled internal drain

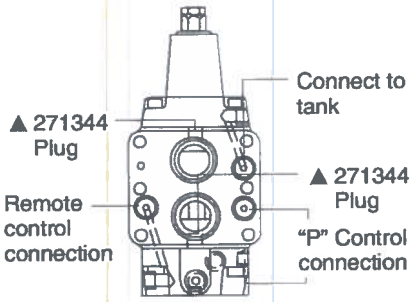


Note
Assemble covers as shown to obtain valve action desired.

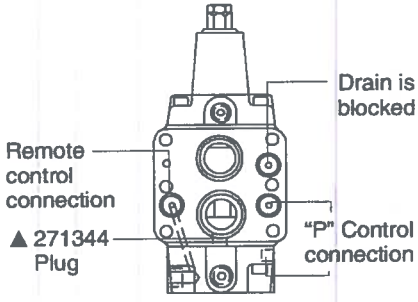
Type 2
RG or RCG series – Sequence valves.
Directly controlled external drain



Type 3
RG or RCG series – Sequence valves.
Remotely controlled external drain



Type 4
RG series – Unloading valve.
RCG series – Counterbalance valve.
Remotely controlled internal drain



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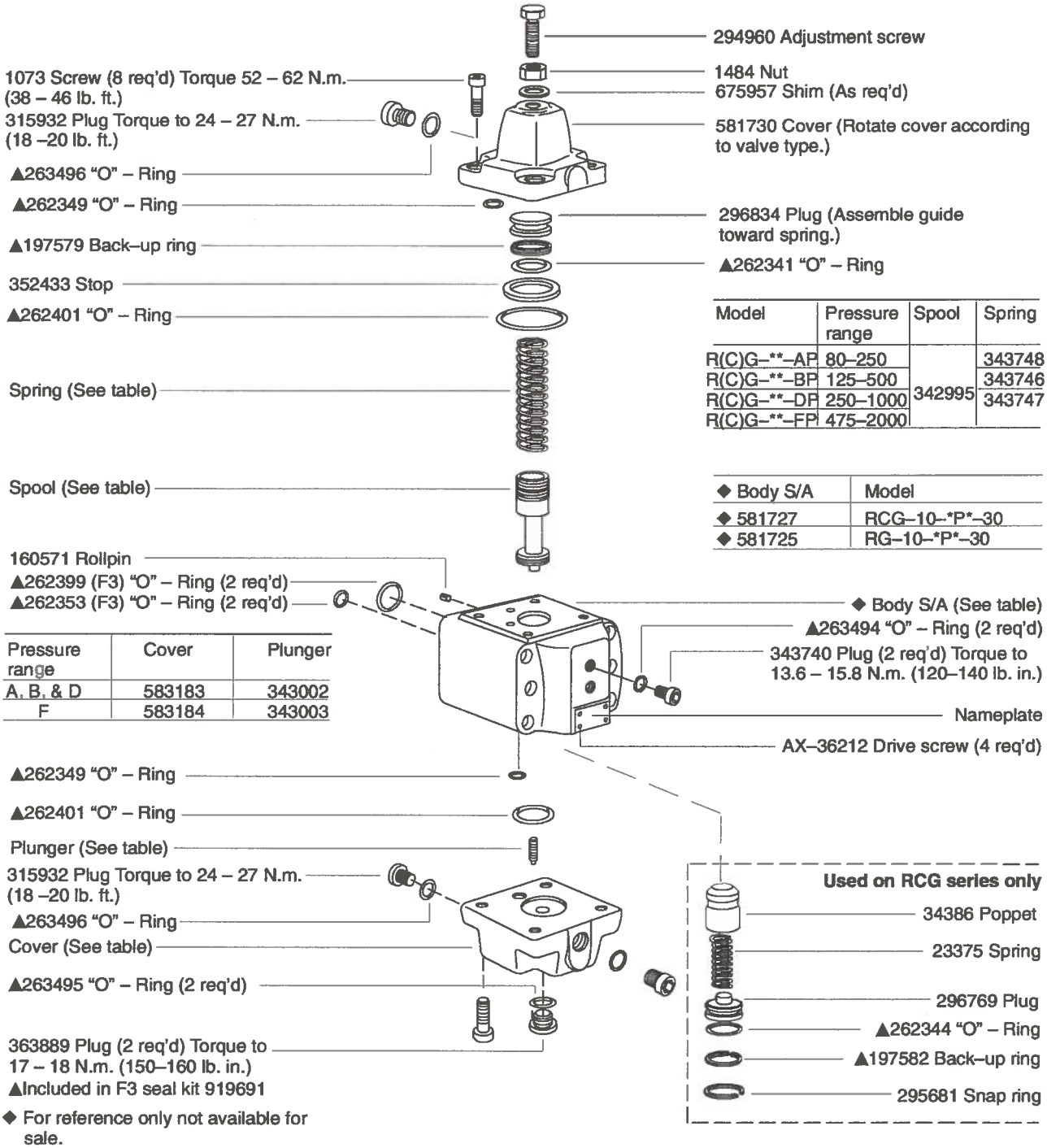
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

R(C)G–10–*P*–30 Series


294960 Adjustment screw
1484 Nut
675957 Shim (As req'd)
581730 Cover (Rotate cover according to valve type.)
296834 Plug (Assemble guide toward spring.)
▲262341 "O" – Ring
1073 Screw (8 req'd) Torque 52 – 62 N.m. (38 – 46 lb. ft.)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263496 "O" – Ring
▲262349 "O" – Ring
▲197579 Back–up ring
352433 Stop
▲262401 "O" – Ring
Spring (See table)
Spool (See table)
160571 Rollpin
▲262399 (F3) "O" – Ring (2 req'd)
▲262353 (F3) "O" – Ring (2 req'd)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Nameplate
AX–36212 Drive screw (4 req'd)
▲262349 "O" – Ring
▲262401 "O" – Ring
Plunger (See table)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263496 "O" – Ring
Cover (See table)
▲263495 "O" – Ring (2 req'd)
363889 Plug (2 req'd) Torque to 17 – 18 N.m. (150–160 lb. in.)
Used on RCG series only
34386 Poppet
23375 Spring
296769 Plug
▲262344 "O" – Ring
▲197582 Back–up ring
295681 Snap ring

Model	Pressure range	Spool	Spring
R(C)G–**–AP	80–250	342995	343748
R(C)G–**–BP	125–500		343746
R(C)G–**–DP	250–1000		343747
R(C)G–**–FP	475–2000		

◆ Body S/A	Model
◆ 581727	RCG–10–*P*–30
◆ 581725	RG–10–*P*–30

Pressure range	Cover	Plunger
A, B, & D	583183	343002
F	583184	343003

▲Included in F3 seal kit 919691

◆ For reference only not available for sale.

VICKERS

Model Code

(F3) - R (C) G - 10 - * P * -30

1 2 3 4 5 6 7 8 9

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option
C – With integral check valve (Reverse free flow)
Omitted – Without check valve

4 Mounting
Manifold or Subplate

5 Nominal valve size
10 – 1 1/4"

6 Pressure range
A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI

7 Auxiliary remote pressure control connection

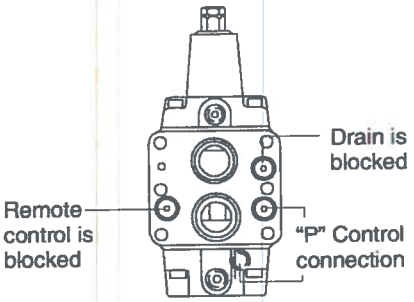
7 Valve types
(Inset views at bottom of page show cover positions for the (4) valve types.)

8 Design

Typical model number
RCG–10–DP4–30

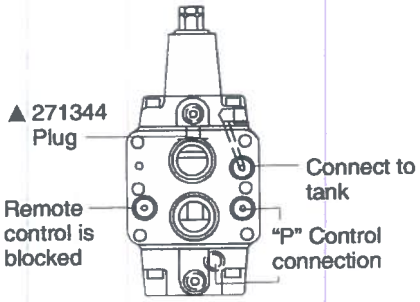
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RG series – Back pressure valve.
RCG series – Counterbalance valve.
Directly controlled internal drain

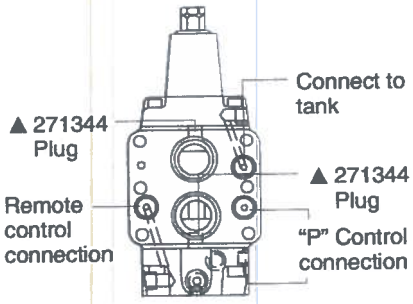


Note
Assemble covers as shown to obtain valve action desired.

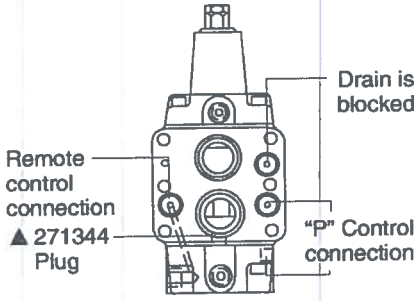
Type 2
RG or RCG series – Sequence valves.
Directly controlled external drain



Type 3
RG or RCG series – Sequence valves.
Remotely controlled external drain



Type 4
RG series – Unloading valve.
RCG series – Counterbalance valve.
Remotely controlled internal drain



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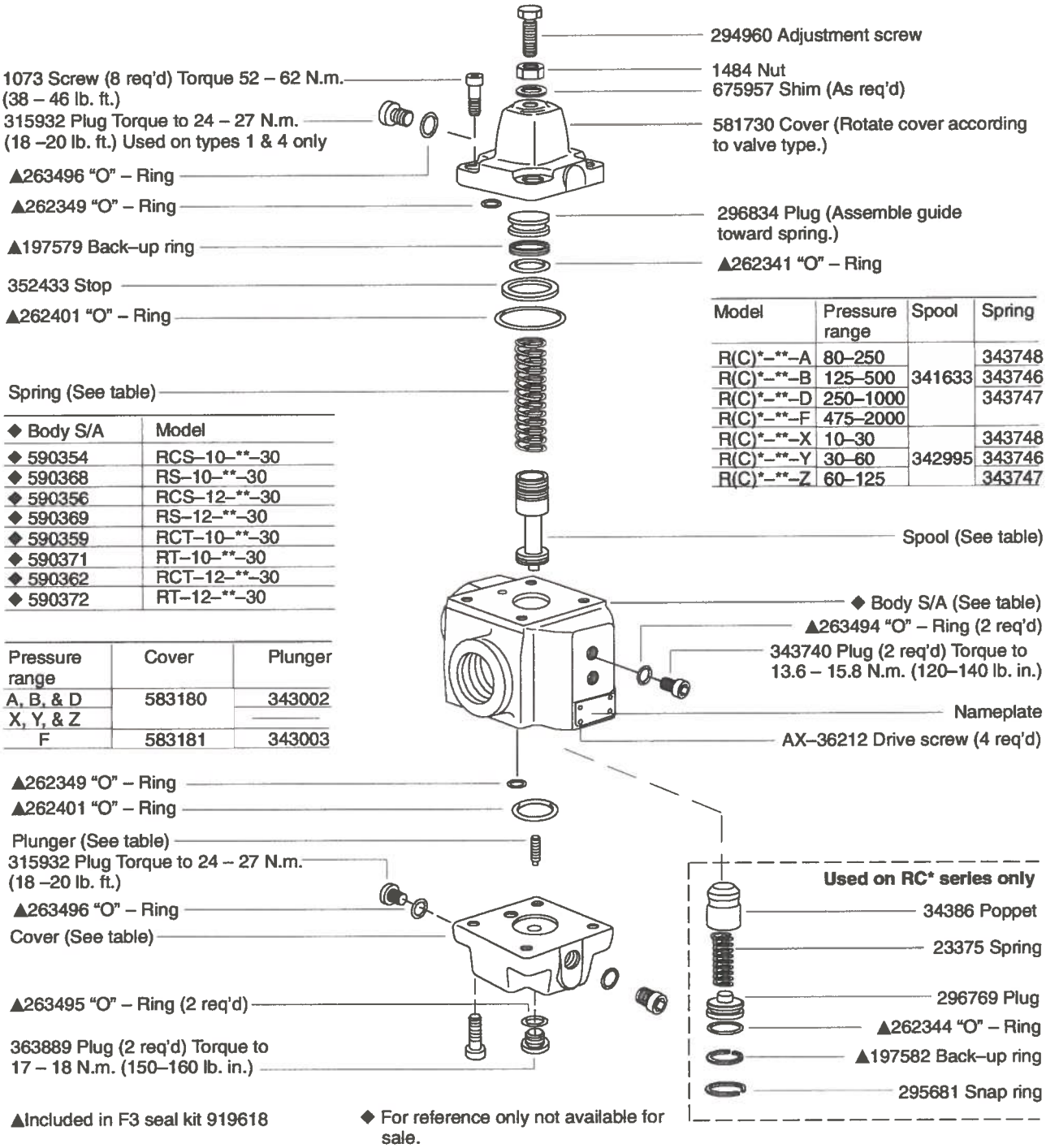
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

R(C)T–10/12––30 Series**
R(C)S–10/12––30 Series**


294960 Adjustment screw
1484 Nut
675957 Shim (As req'd)
581730 Cover (Rotate cover according to valve type.)
1073 Screw (8 req'd) Torque 52 – 62 N.m. (38 – 46 lb. ft.)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 4 only
▲263496 "O" – Ring
▲262349 "O" – Ring
296834 Plug (Assemble guide toward spring.)
▲197579 Back–up ring
▲262341 "O" – Ring
352433 Stop
▲262401 "O" – Ring
Spring (See table)
Spool (See table)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Nameplate
AX–36212 Drive screw (4 req'd)
▲262349 "O" – Ring
▲262401 "O" – Ring
Plunger (See table)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.)
▲263496 "O" – Ring
Cover (See table)
▲263495 "O" – Ring (2 req'd)
363889 Plug (2 req'd) Torque to 17 – 18 N.m. (150–160 lb. in.)
Used on RC* series only
34386 Poppet
23375 Spring
296769 Plug
▲262344 "O" – Ring
▲197582 Back–up ring
295681 Snap ring

Model	Pressure range	Spool	Spring
R(C)*–**–A	80–250	341633	343748
R(C)*–**–B	125–500		343746
R(C)*–**–D	250–1000		343747
R(C)*–**–F	475–2000		
R(C)*–**–X	10–30	342995	343748
R(C)*–**–Y	30–60		343746
R(C)*–**–Z	60–125		343747

◆ Body S/A	Model
◆ 590354	RCS–10–**–30
◆ 590368	RS–10–**–30
◆ 590356	RCS–12–**–30
◆ 590369	RS–12–**–30
◆ 590359	RCT–10–**–30
◆ 590371	RT–10–**–30
◆ 590362	RCT–12–**–30
◆ 590372	RT–12–**–30

Pressure range	Cover	Plunger
A, B, & D	583180	343002
X, Y, & Z		
F	583181	343003

▲Included in F3 seal kit 919618

◆ For reference only not available for sale.

VICKERS

Model Code

(F3) - R (C) T - ** - ** - 3*

1 2 3 4 5 6 7 8

1 Special seals
(Omit on STD. models.)

2 Pressure actuated control valve

3 Check valve option

C – With integral check valve (Reverse free flow)
Omitted – Without check valve

4 Threaded connections

S – Straight threads
T – NPTF threads

5 Nominal valve size

10 – S – 1.6250–12 UN–2B THD.
T – 1 1/4" NPTF THREAD
12 – S – 1.8750–12 UN–2B THD.
T – 1 1/2" NPTF THREAD

6 Pressure range

A – 80 – 250 PSI max.
B – 125 – 500 PSI max.
D – 250 – 1000 PSI max.
F – 475 – 2000 PSI max.
X – 10 – 30 PSI max.
Y – 30 – 60 PSI max.
Z – 60 – 125 PSI max.

7 Valve types

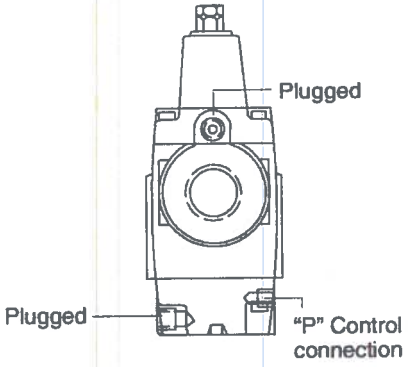
(Inset views at bottom of page show cover positions for the (4) valve types.)

8 Design

Typical model number
RCT–10–4–30

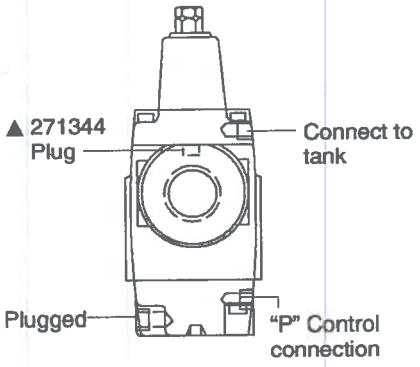
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RT series – Back pressure valve.
RCT series – Counterbalance valve.
Directly controlled internal drain

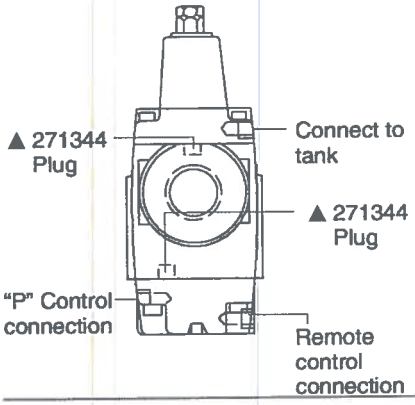


Note
Assemble covers as shown to obtain valve action desired.

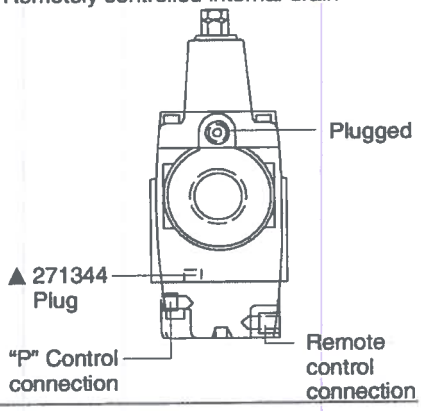
Type 2
RT or RCT series – Sequence valves.
Directly controlled external drain



Type 3
RT or RCT series – Sequence valves.
Remotely controlled external drain



Type 4
RT series – Unloading valve.
RCT series – Counterbalance valve.
Remotely controlled internal drain



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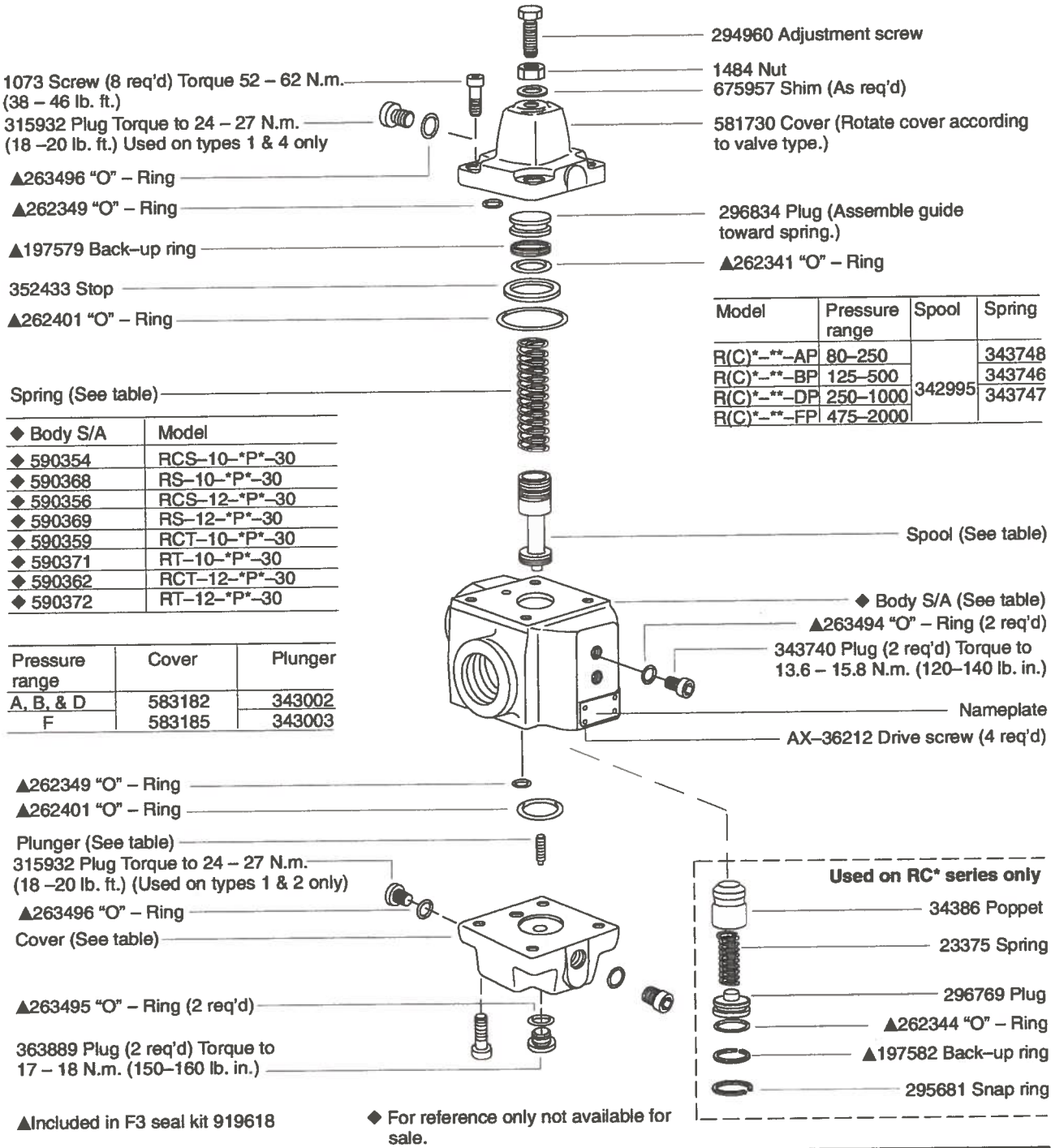
Service Data

Vickers®

Pressure Relief

Pressure Control Valves

R(C)T–10/12–*P*–30 Series
R(C)S–10/12–*P*–30 Series


294960 Adjustment screw
1484 Nut
675957 Shim (As req'd)
581730 Cover (Rotate cover according to valve type.)
1073 Screw (8 req'd) Torque 52 – 62 N.m. (38 – 46 lb. ft.)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) Used on types 1 & 4 only
▲263496 "O" – Ring
▲262349 "O" – Ring
296834 Plug (Assemble guide toward spring.)
▲197579 Back–up ring
▲262341 "O" – Ring
352433 Stop
▲262401 "O" – Ring
Spring (See table)
Spool (See table)
◆ Body S/A (See table)
▲263494 "O" – Ring (2 req'd)
343740 Plug (2 req'd) Torque to 13.6 – 15.8 N.m. (120–140 lb. in.)
Nameplate
AX–36212 Drive screw (4 req'd)
▲262349 "O" – Ring
▲262401 "O" – Ring
Plunger (See table)
315932 Plug Torque to 24 – 27 N.m. (18 –20 lb. ft.) (Used on types 1 & 2 only)
▲263496 "O" – Ring
Cover (See table)
▲263495 "O" – Ring (2 req'd)
363889 Plug (2 req'd) Torque to 17 – 18 N.m. (150–160 lb. in.)
Used on RC* series only
34386 Poppet
23375 Spring
296769 Plug
▲262344 "O" – Ring
▲197582 Back–up ring
295681 Snap ring

Model	Pressure range	Spool	Spring
R(C)*–**–AP	80–250	342995	343748
R(C)*–**–BP	125–500		343746
R(C)*–**–DP	250–1000		343747
R(C)*–**–FP	475–2000		

◆ Body S/A	Model
◆ 590354	RCS–10–*P*–30
◆ 590368	RS–10–*P*–30
◆ 590356	RCS–12–*P*–30
◆ 590369	RS–12–*P*–30
◆ 590359	RCT–10–*P*–30
◆ 590371	RT–10–*P*–30
◆ 590362	RCT–12–*P*–30
◆ 590372	RT–12–*P*–30

Pressure range	Cover	Plunger
A, B, & D	583182	343002
F	583185	343003

▲Included in F3 seal kit 919618

◆ For reference only not available for sale.

VICKERS

Model Code

(F3) - R (C) T - ** - * P* - 3*

1 2 3 4 5 6 7 8 9

1 Special seals
(Omit on STD. models.)

2 Pressure control valve

3 Check valve option

C – With integral check valve (Reverse free flow)
Omitted – Without check valve

4 Threaded connections

S – Straight threads
T – NPTF threads

5 Nominal valve size

10 – S – 1.6250–12 UN–2B THD. for 1.25 O. D. tubing
T – 1 1/4" NPTF THREAD
12 – S – 1.8750–12 UN–2B THD. for 1.50 O. D. tubing
T – 1 1/2" NPTF THREAD

6 Pressure range

A – 80 – 250 PSI
B – 125 – 500 PSI
D – 250 – 1000 PSI
F – 475 – 2000 PSI

7 Auxiliary remote pressure control connection

8 Valve types

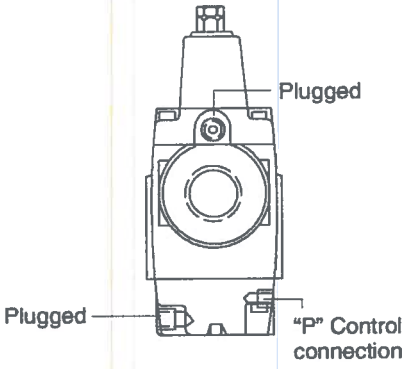
(Inset views at bottom of page show cover positions for the (4) valve types.)

9 Design

Typical model number
RCT–10–4–30

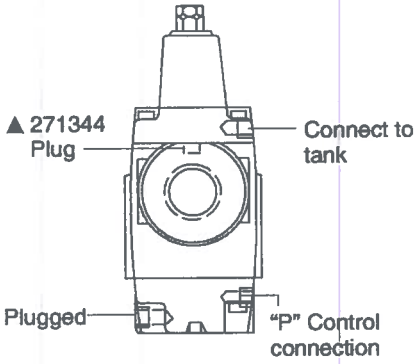
Note
Assemble covers as shown to obtain valve action desired.

Type 1
RT series – Back pressure valve.
RCT series – Counterbalance valve.
Directly controlled internal drain

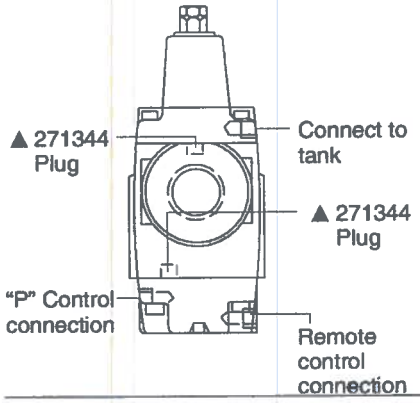


Note
Assemble covers as shown to obtain valve action desired.

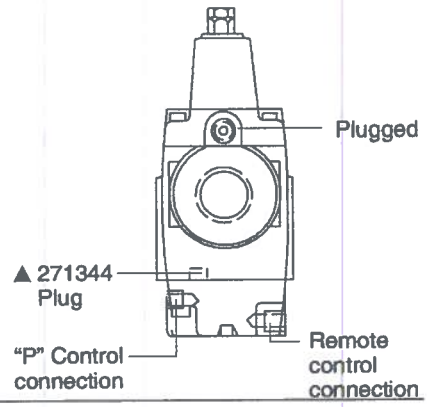
Type 2
RT or RCT series – Sequence valves.
Directly controlled external drain



Type 3
RT or RCT series – Sequence valves.
Remotely controlled external drain



Type 4
RT series – Unloading valve.
RCT series – Counterbalance valve.
Remotely controlled internal drain



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Service Data

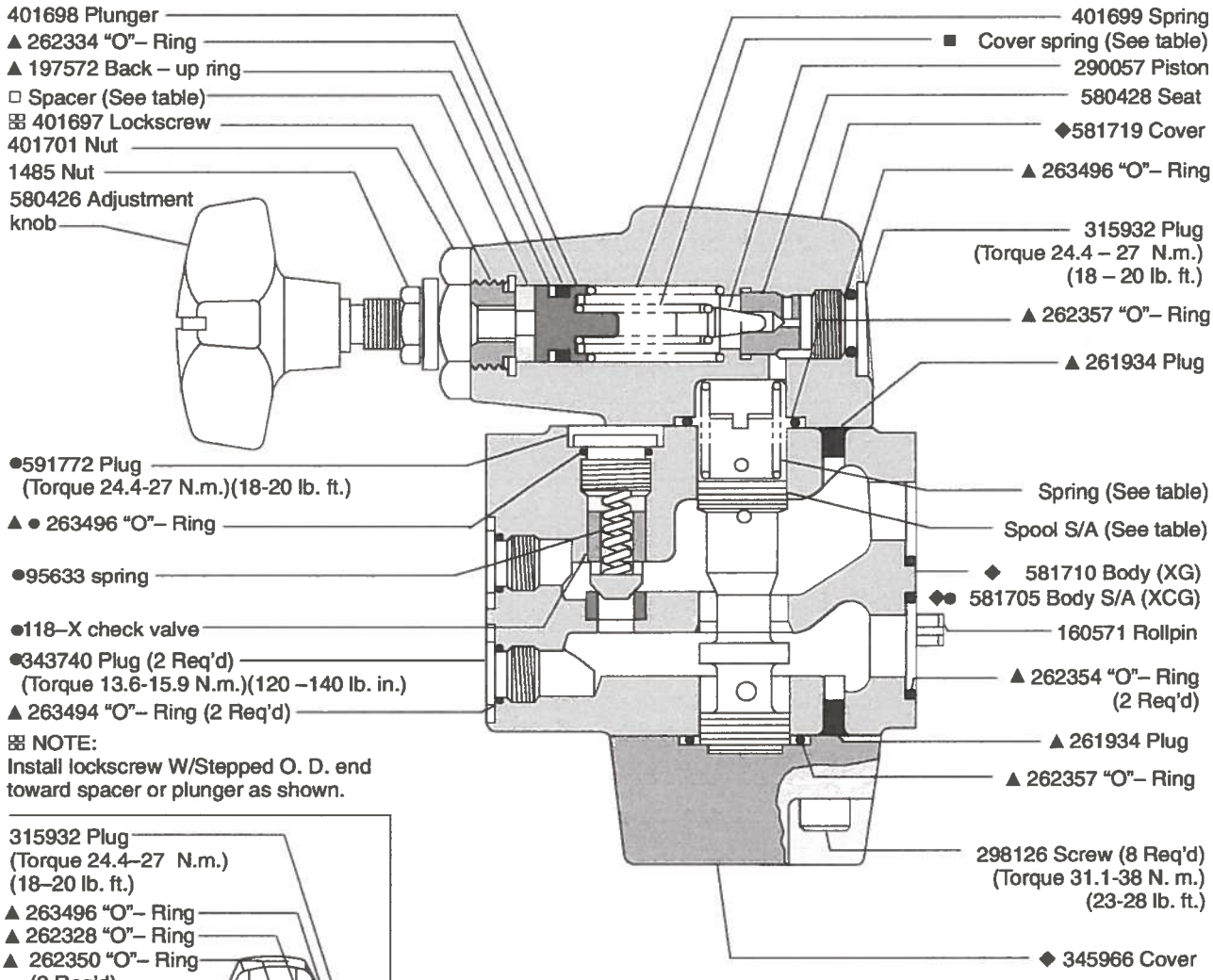
Vickers®

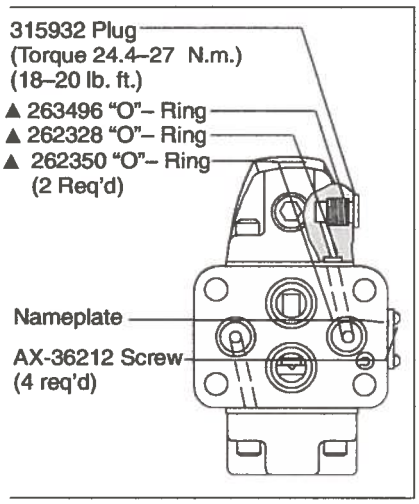
Pressure Relief

EATON

Pressure Reducing Valves

X(C)G-(H)03-**-30


401698 Plunger
▲ 262334 "O"– Ring
▲ 197572 Back – up ring
□ Spacer (See table)
⊞ 401697 Lockscrew
401701 Nut
1485 Nut
580426 Adjustment knob
●591772 Plug (Torque 24.4-27 N.m.)(18-20 lb. ft.)
▲ ● 263496 "O"– Ring
●95633 spring
●118–X check valve
●343740 Plug (2 Req'd) (Torque 13.6-15.9 N.m.)(120 –140 lb. in.)
▲ 263494 "O"– Ring (2 Req'd)
⊞ NOTE: Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.
401699 Spring
■ Cover spring (See table)
290057 Piston
580428 Seat
◆581719 Cover
▲ 263496 "O"– Ring
315932 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 262357 "O"– Ring
▲ 261934 Plug
Spring (See table)
Spool S/A (See table)
◆ 581710 Body (XG)
◆● 581705 Body S/A (XCG)
160571 Rollpin
▲ 262354 "O"– Ring (2 Req'd)
▲ 261934 Plug
▲ 262357 "O"– Ring
298126 Screw (8 Req'd) (Torque 31.1-38 N. m.) (23-28 lb. ft.)
◆ 345966 Cover



Model	■ Cover spring	□ Spacer	Pressure range P.S.I.
X*G-(H)03-1-30	2280		1000
X*G-(H)03-2-30	583937		2000
X*G-(H)03-3-30	401700	386715	2850

◆ Not available for sale.

● Used on model XC* only.

▲ Service all units with F3 seal kit 919836.

VICKERS

Model Code

(F3) - X (C) G - (H) 03 - * * - 30

1 2 3 4 5 6 7 8 9

1 Seals

F3 - Seals for mneral oil and fire resistant fluids

2 Pressure Reducing Valve

3 Integal Check Valve

Omitted – no check valve

4 Manifold or Subplate Mounted

5 Rated Flow @ 30 USgpm

Omit for "B" & "F" models

6 Nominal valve size $^{3}/_{4}$ inch

03 - 3/8 inch

7 Maximum adjustable pressure

1 – 1000 PSI
2 – 2000 PSI
3 – 2850 PSI

8 Maximum rated flow capacity

B -7 USgpm
F -14 USgpm

9 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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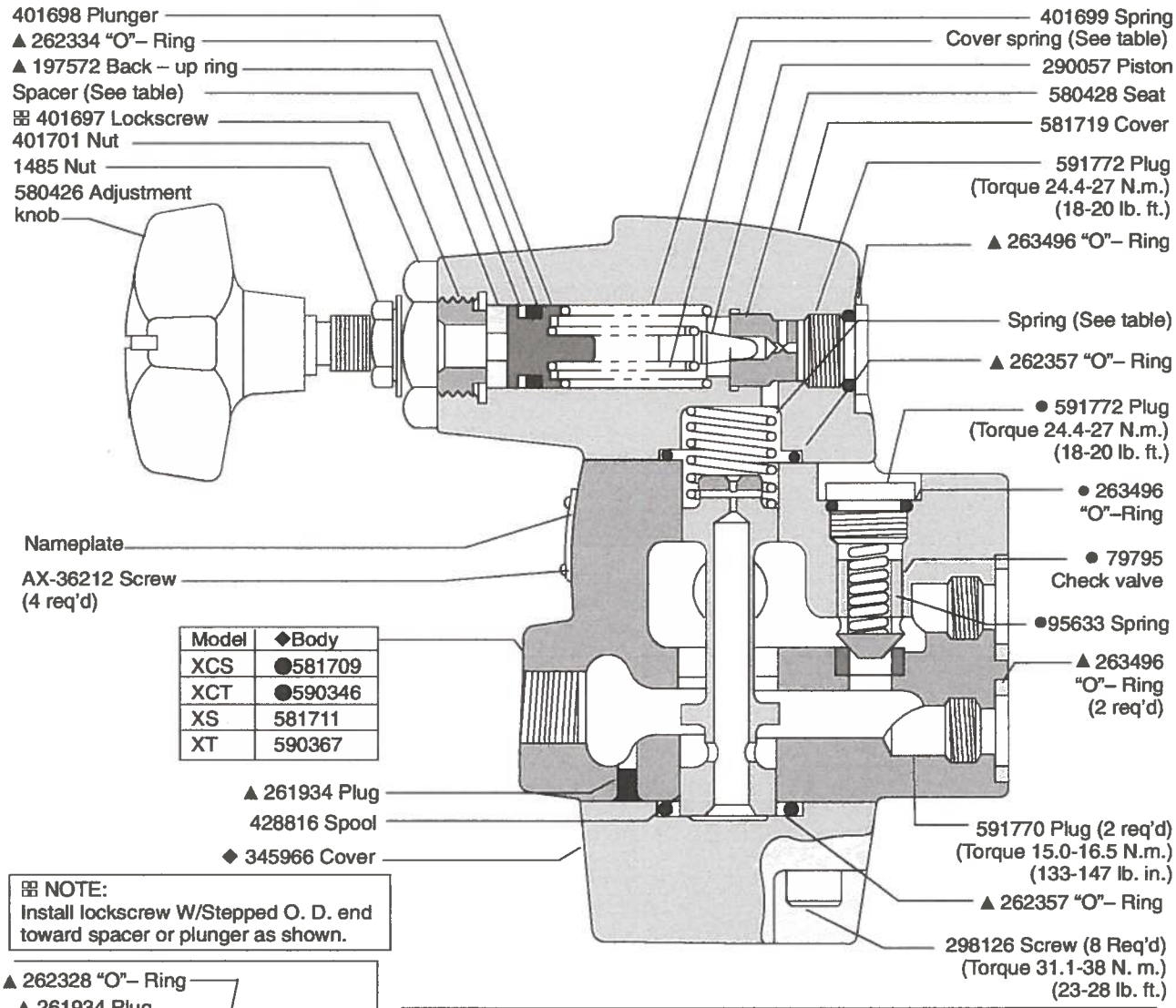
Service Data

Vickers®

Pressure Relief

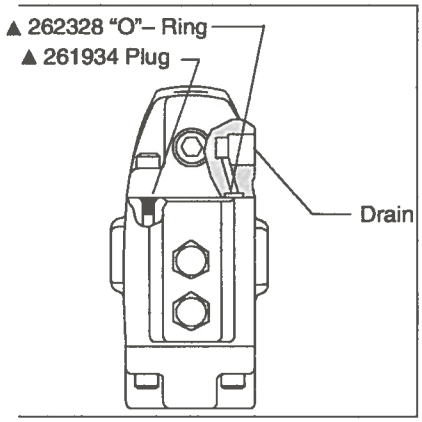
Pressure Reducing Valves

X(C)T-03--30**
X(C)S-03--30**



Model	◆Body
XCS	●581709
XCT	●590346
XS	581711
XT	590367

⊞ NOTE:
Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.



Model	Spring	Cover spring	Spacer	Pressure range P.S.I.	Rated flow USgpm
XC*-03-1B-30	428817	2280	—	75-1000	7
XC*-03-1F-30	428818			150-1000	14
XC*-03-2B-30	428817	583937		75-2000	7
XC*-03-2F-30	428818			150-2000	14
XC*-03-3F-30		401700	386715	150-2850	

◆ Not available for sale.

● Used on model XCS & XCT only.

▲ Service all units with F3 seal kit 919836.

VICKERS

Model Code

(F3) - X (C) *- 03 - * * - 30

1 2 3 4 5 6 7 8

1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Pressure Reducing Valve

3 Integal Check Valve

Omitted – no check valve

4 Threaded Connections

S - .750-16 UNF-2B thd.
T - 3/8 inch NPTF thd.

5 Nominal valve size

03 - 3/8 inch

6 Maximum adjustable pressure

1 – 1000 PSI
2 – 2000 PSI
3 – 3000 PSI

7 Maximum rated flow capacity

B -7 USgpm
F -14 USgpm

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code **20/18/15** or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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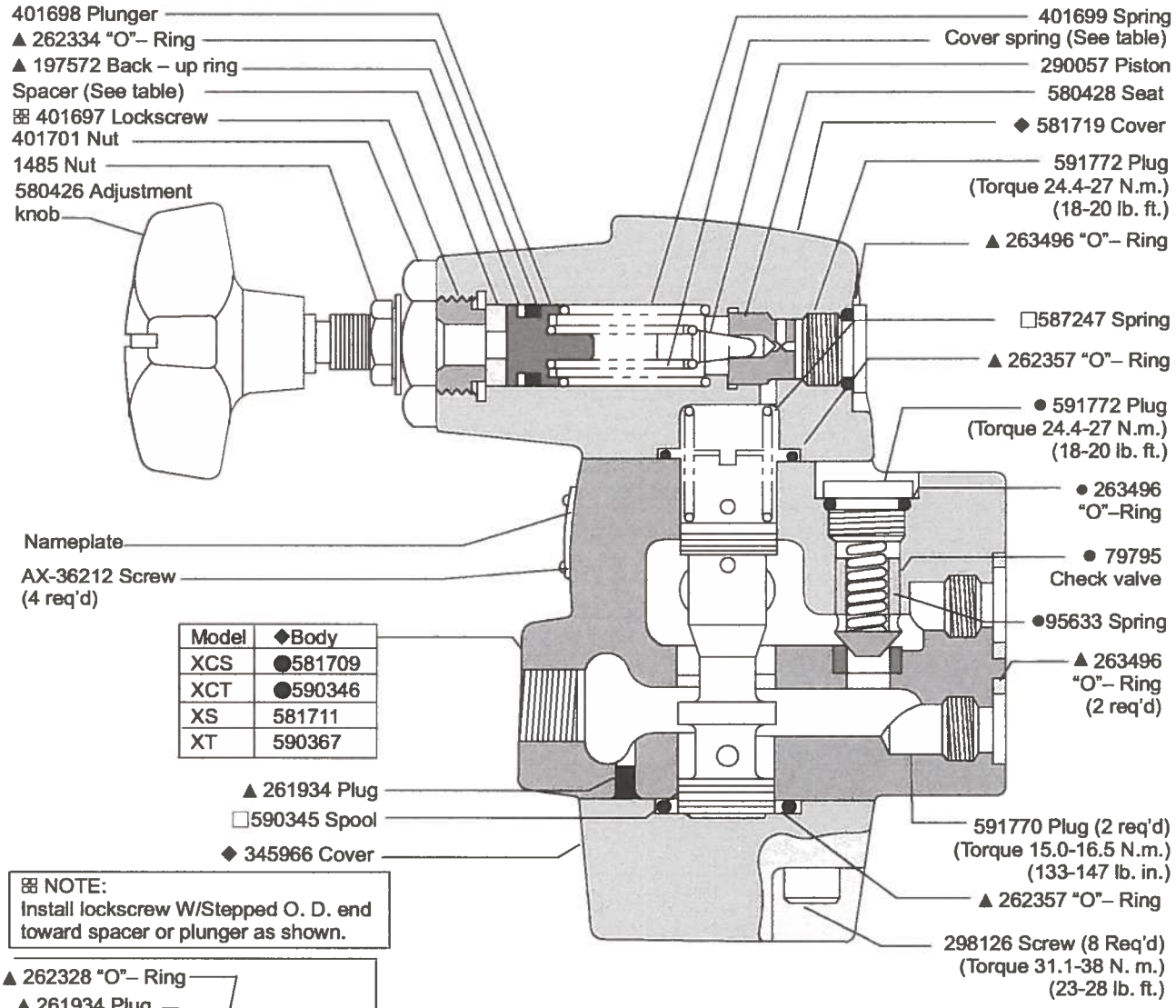
Service Data

Vickers®

Pressure Controls

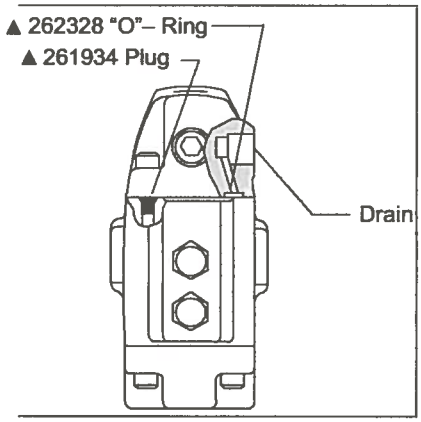
Pressure Reducing Valves

X(C)T-H03-*-30
X(C)S-H03-*-30



Model	◆Body
XCS	●581709
XCT	●590346
XS	581711
XT	590367

⊞ NOTE:
Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.



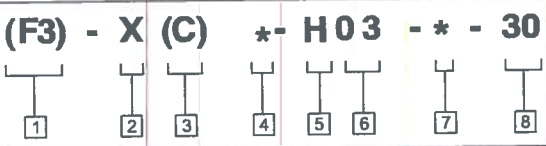
Model	Cover spring	Spacer	Pressure range P.S.I.
X(C)*-H03-1-30	2280	—	1000
X(C)*-H03-2-30	583937		2000
X(C)*-H03-3-30	401700	386715	2850

◆ Not available for sale.

● Used on model XC* only.

▲ Service all units with F3 seal kit 919836.

Model Code



1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Pressure Reducing Valve

3 Integal Check Valve

4 Threaded Connections

S - .750-16 UNF-2B thd.
T - 3/8 inch NPTF thd.

5 High Flow – 30 USgpm

6 Nominal valve size

03 - 3/8 inch

7 Maximum adjustable pressure

1 – 1000 PSI
2 – 2000 PSI
3 – 2850 PSI

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code **20/18/15** or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

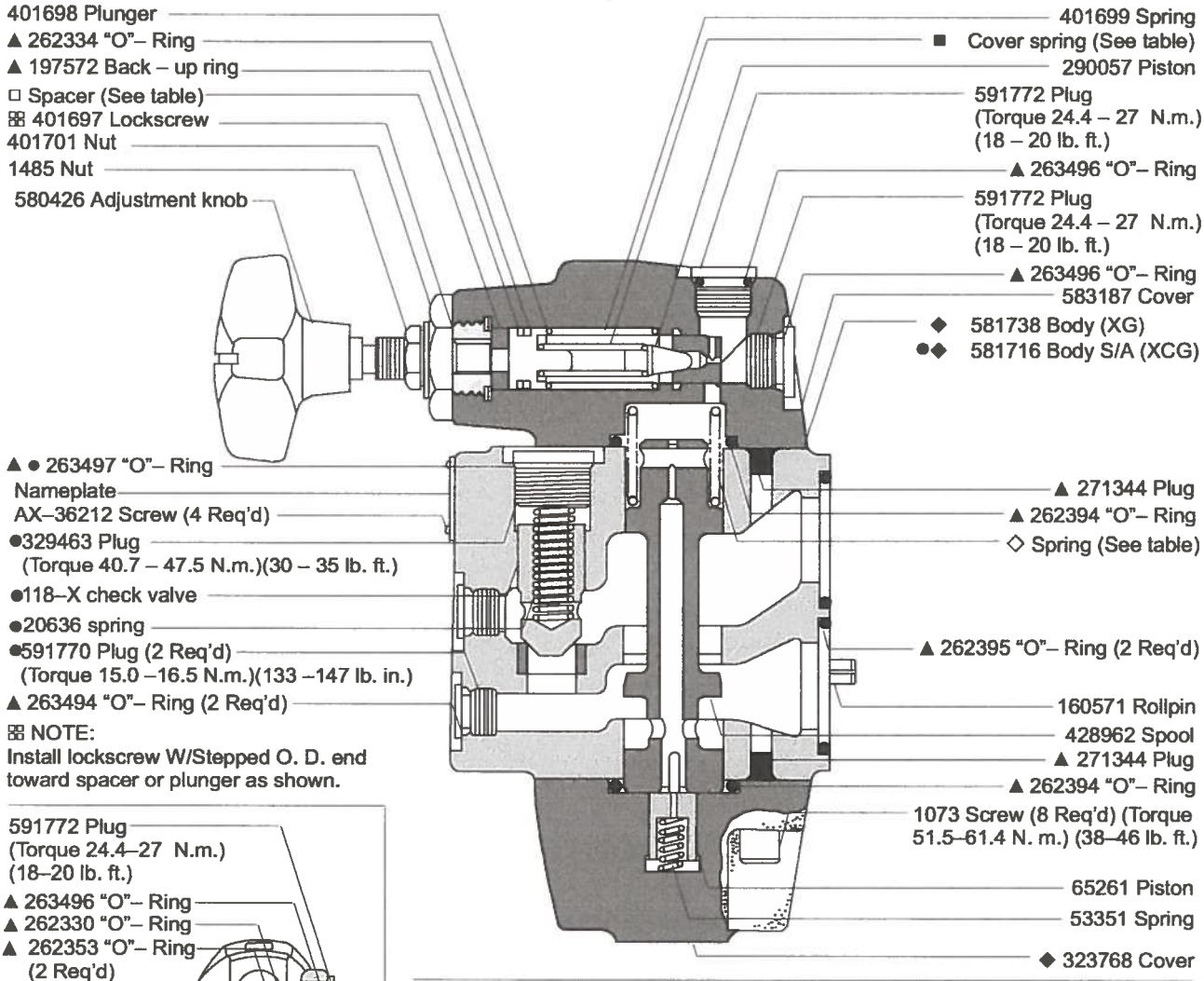
Service Data

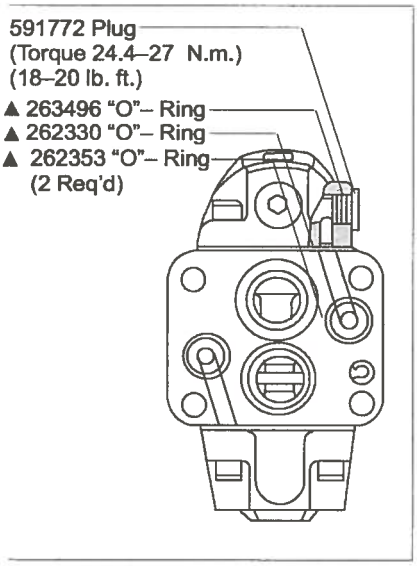
Vickers®

Pressure Controls

Pressure Reducing Valves

X(C)G–06–* *–30





Model	◇ Spring	■ Cover spring	□ Spacer	Pressure range P.S.I.	Rated flow USGPM
X(C)G–**–1B–30	322653	2280	———	80–1000	15
X(C)G–**–1F–30	348614			200–1000	30
X(C)G–**–2B–30	322653	583937		80–2000	15
X(C)G–**–2F–30	348614			200–2000	30
X(C)G–**–3B–30	322653	401700	386715	200–2850	15
X(C)G–**–3F–30	348614				30

▲ Service all units with F3 seal kit 919615.
◆ Not available for sale.
● Used on model XCG only.

Model Code

(F3) - X(C)G - 06 - * * -30

1 2 3 4 5 6 7 8

1 Seals for mineral oil & fire resistant fluids

2 Pressure reducing valve

3 Integal check valve
Omitted – no check valve

4 Manifold or subplate mounted

5 Nominal valve size $^{3}/_{4}$ inch

6 Maximum adjustable pressure

1 – 1000 PSI
2 – 2000 PSI
3 – 3000 PSI

7 Maximum rated flow capacity

B –15 USGPM
F –30 USGPM

8 Design

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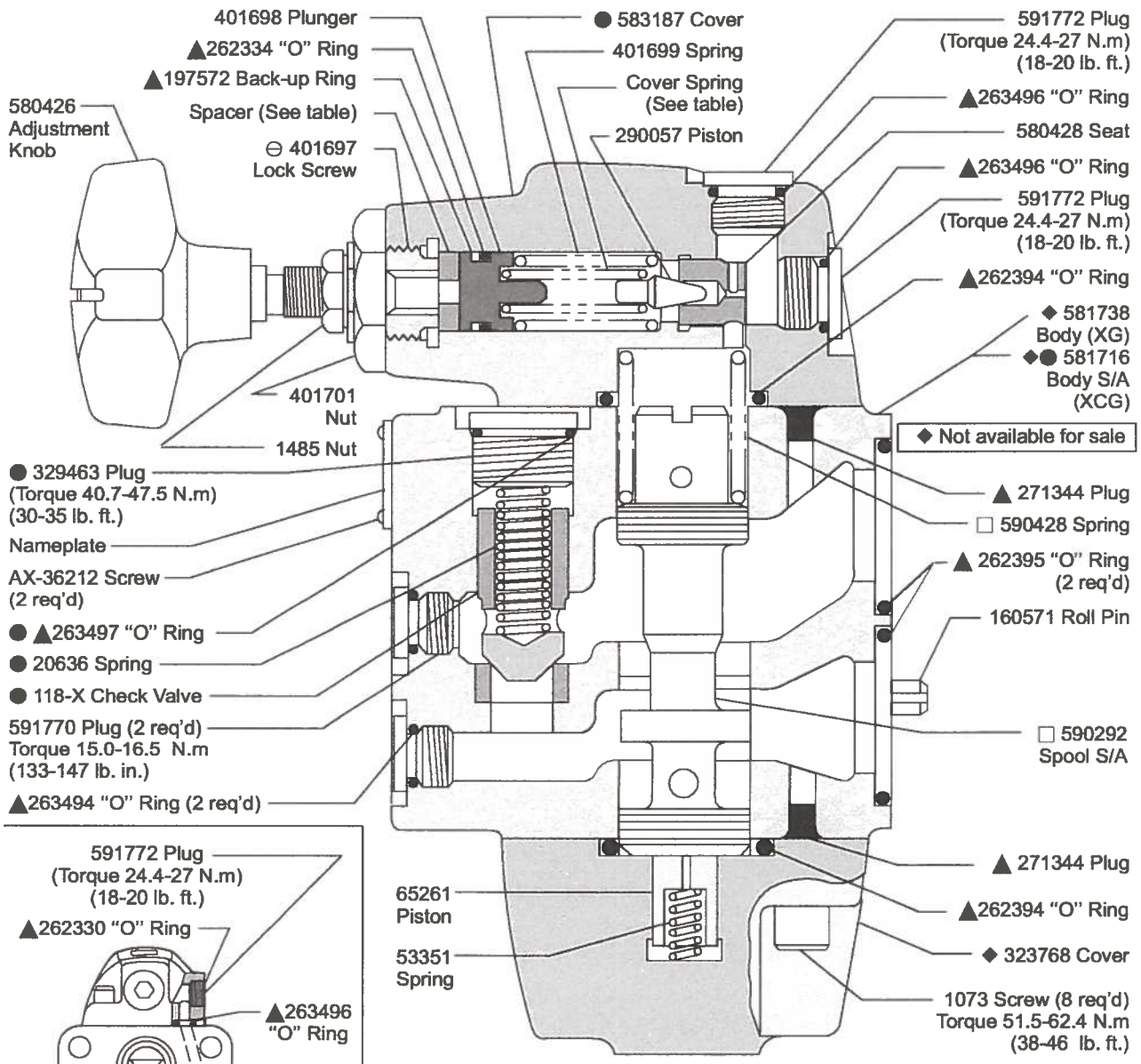
Service Data

Vickers®

Pressure Controls

Pressure Reducing Valves

X(C)G-H06-**-30


401698 Plunger
▲262334 "O" Ring
▲197572 Back-up Ring
Spacer (See table)
⊖ 401697 Lock Screw
580426 Adjustment Knob
401701 Nut
1485 Nut
● 329463 Plug (Torque 40.7-47.5 N.m) (30-35 lb. ft.)
Nameplate
AX-36212 Screw (2 req'd)
● ▲263497 "O" Ring
● 20636 Spring
● 118-X Check Valve
591770 Plug (2 req'd) Torque 15.0-16.5 N.m (133-147 lb. in.)
▲263494 "O" Ring (2 req'd)
● 583187 Cover
401699 Spring
Cover Spring (See table)
290057 Piston
591772 Plug (Torque 24.4-27 N.m) (18-20 lb. ft.)
▲263496 "O" Ring
580428 Seat
▲263496 "O" Ring
591772 Plug (Torque 24.4-27 N.m) (18-20 lb. ft.)
▲262394 "O" Ring
◆ 581738 Body (XG)
◆● 581716 Body S/A (XCG)
◆ Not available for sale
▲ 271344 Plug
□ 590428 Spring
▲ 262395 "O" Ring (2 req'd)
160571 Roll Pin
□ 590292 Spool S/A
▲ 271344 Plug
▲262394 "O" Ring
◆ 323768 Cover
1073 Screw (8 req'd) Torque 51.5-62.4 N.m (38-46 lb. ft.)
65261 Piston
53351 Spring
591772 Plug (Torque 24.4-27 N.m) (18-20 lb. ft.)
▲262330 "O" Ring
▲263496 "O" Ring
▲262353 "O" Ring (2 req'd)

● For XCG Models only

Model	Cover Spring	Spacer	Maximum P.S.I.
X(C)G-H06-1-30	2280	———	1000
X(C)G-H06-2-30	583937		2000
X(C)G-H06-3-30	401700	386715	2850

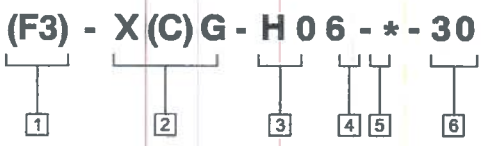
□ Included in Spool S/A Kit 941390

▲Service all units with F3 Seal Kit 919615

⊖ Note
Install Lockscrew with stepped O.D. end toward Spacer or Plunger as shown.

VICKERS

Model Code



1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

XC - Pressure reducing valve, integral check valve

Mount Type

G - Manifold of subplate mounted

3 High Flow

70 USGPM

4 Nominal Valve Size

3/4 inch

5 Maximum Adjustable Pressure

1 - 1000 PSI
2 - 2000 PSI
3 - 2850 PSI

6 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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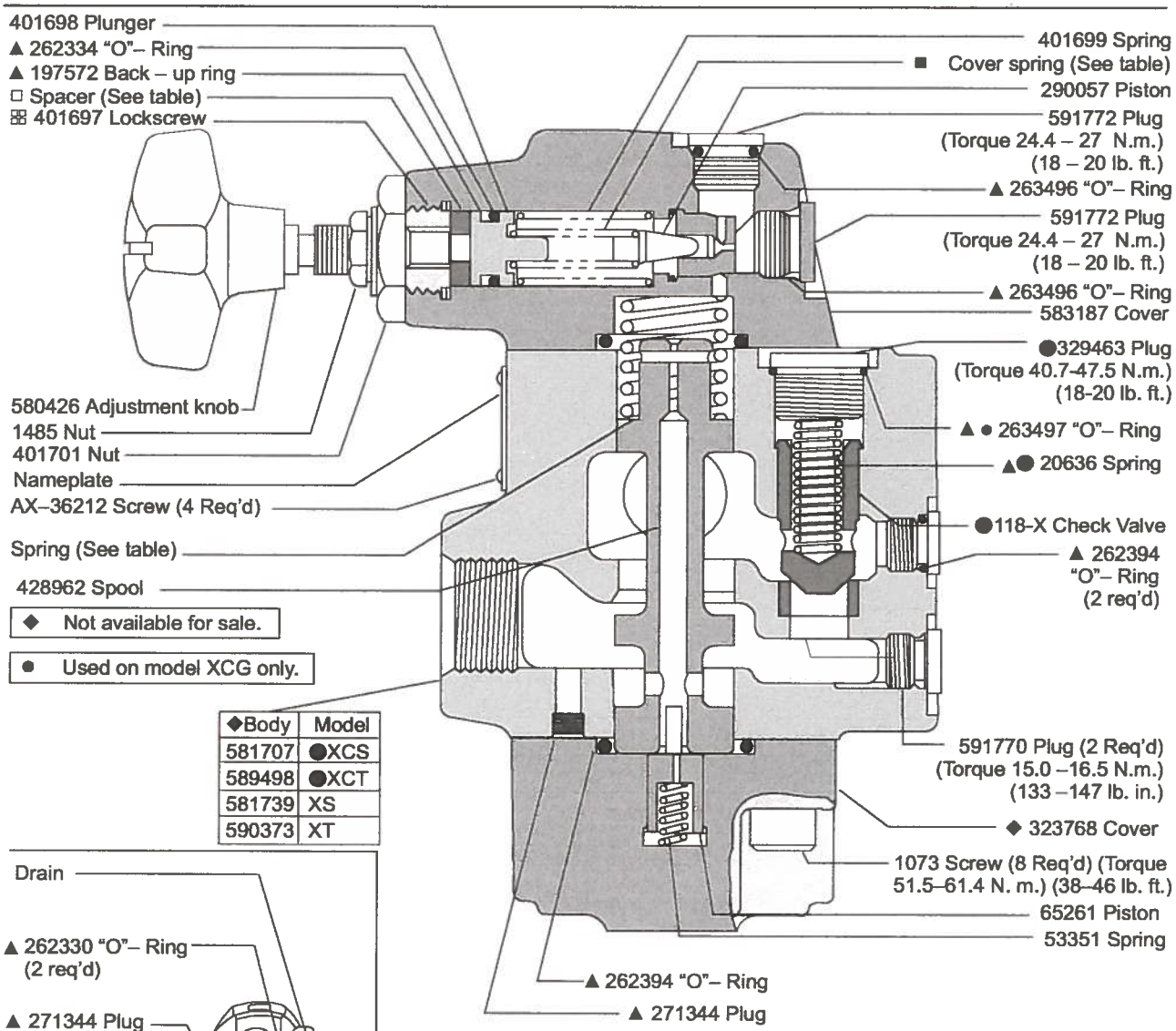
Service Data

Vickers®

Pressure Controls

Pressure Reducing Valves

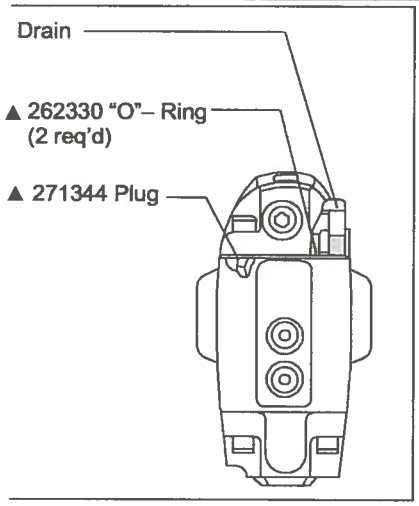
X(C)S - 06 - ** - 30
X(C)Y - 06 - ** - 30


401698 Plunger
▲ 262334 "O"– Ring
▲ 197572 Back – up ring
□ Spacer (See table)
⊞ 401697 Lockscrew
580426 Adjustment knob
1485 Nut
401701 Nut
Nameplate
AX–36212 Screw (4 Req'd)
Spring (See table)
428962 Spool
401699 Spring
■ Cover spring (See table)
290057 Piston
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 263496 "O"– Ring
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 263496 "O"– Ring
583187 Cover
●329463 Plug (Torque 40.7-47.5 N.m.) (18-20 lb. ft.)
▲ ● 263497 "O"– Ring
▲● 20636 Spring
●118-X Check Valve
▲ 262394 "O"– Ring (2 req'd)
591770 Plug (2 Req'd) (Torque 15.0 –16.5 N.m.) (133 –147 lb. in.)
◆ 323768 Cover
1073 Screw (8 Req'd) (Torque 51.5–61.4 N. m.) (38–46 lb. ft.)
65261 Piston
53351 Spring
▲ 262394 "O"– Ring
▲ 271344 Plug

◆ Not available for sale.

● Used on model XCG only.

◆Body	Model
581707	●XCS
589498	●XCT
581739	XS
590373	XT



Model	◇ Spring	■ Cover spring	□ Spacer	Pressure range P.S.I.	Rated flow USGPM
X(C)*–06–1B–30	322653	2280		80–1000	15
X(C)*–06–1F–30	348614			200–1000	30
X(C)*–06–2B–30	322653	583937		80–2000	15
X(C)*–06–2F–30	348614			200–2000	30
X(C)*–06–3B–30	322653	401700	386715	200–2850	15
X(C)*–06–3F–30	348614				30

⊞ NOTE
Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.

▲ Service all units with F3 seal kit 919615.

Model Code

(F3) - X(C)* - 06 - ** -30

1 2 3 4 5 6 7 8

1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

X - Pressure reducing valve

3 Integral Check Valve

Omitted - No check valve

4 Threaded Connections

S - 1.0625-12UN-2B Thd.
T - 3/4 inch NPTF Thd.

5 Nominal Valve Size

06 - 3/4 inch

6 Maximum Adjustable Pressure

1 - 1000 PSI
2 - 2000 PSI
3 - 3000 PSI

7 Maximum Rated Flow Capacity

B - 15 USgpm
F - 30 USgpm

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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Service Data

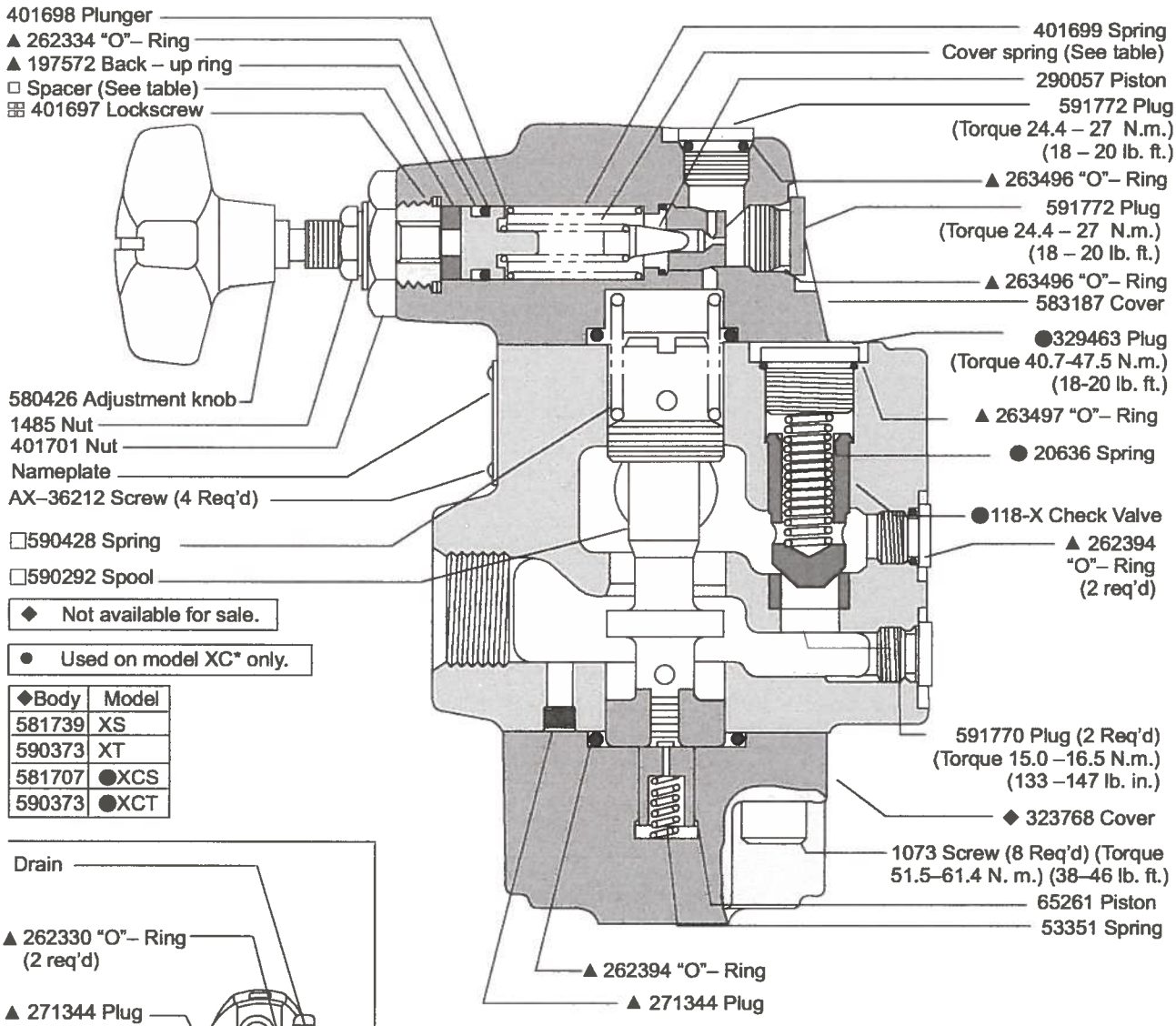
Vickers®

Pressure Controls

EATON

Pressure Reducing Valves

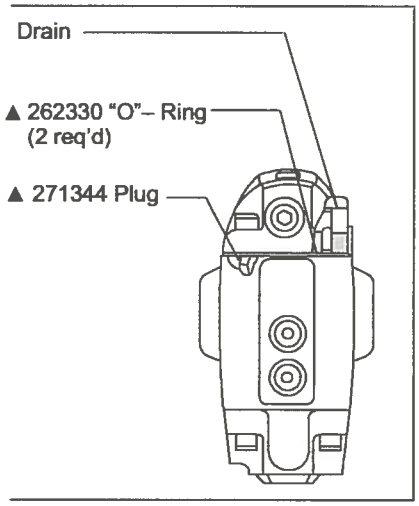
X(C)S - 06 - ** - 30
X(C)Y - 06 - ** - 30



◆ Not available for sale.

● Used on model XC* only.

◆Body	Model
581739	XS
590373	XT
581707	●XCS
590373	●XCT



Model	■ Cover spring	□ Spacer	Maximum P.S.I.
X(C)*–H06–1–30	2280	———	1000
X(C)*–H06–2–30	583937		2000
X(C)*–H06–3–30	401700	386715	2850

□Included in Spool Kit S/A 941390

⊞ **NOTE**
Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.

▲ Service all units with F3 seal kit 919615.

Model Code

(F3) - X(C)* - H06 - **-30

1 2 3 4 5 6 7 8 9

1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

X - Pressure reducing valve

3 Integral Check Valve

Omitted - No check valve

4 Threaded Connections

S - 1.0625-12UN-2B Thd.
T - 3/4 inch NPTF Thd.

5 High Flow

H - 70 USgpm

6 Nominal Valve Size

06 - 3/4 inch

7 Maximum Adjustable Pressure

1 - 1000 PSI
2 - 2000 PSI
3 - 3000 PSI

8 Maximum Rated Flow Capacity

B - 15 USgpm
F - 30 USgpm

9 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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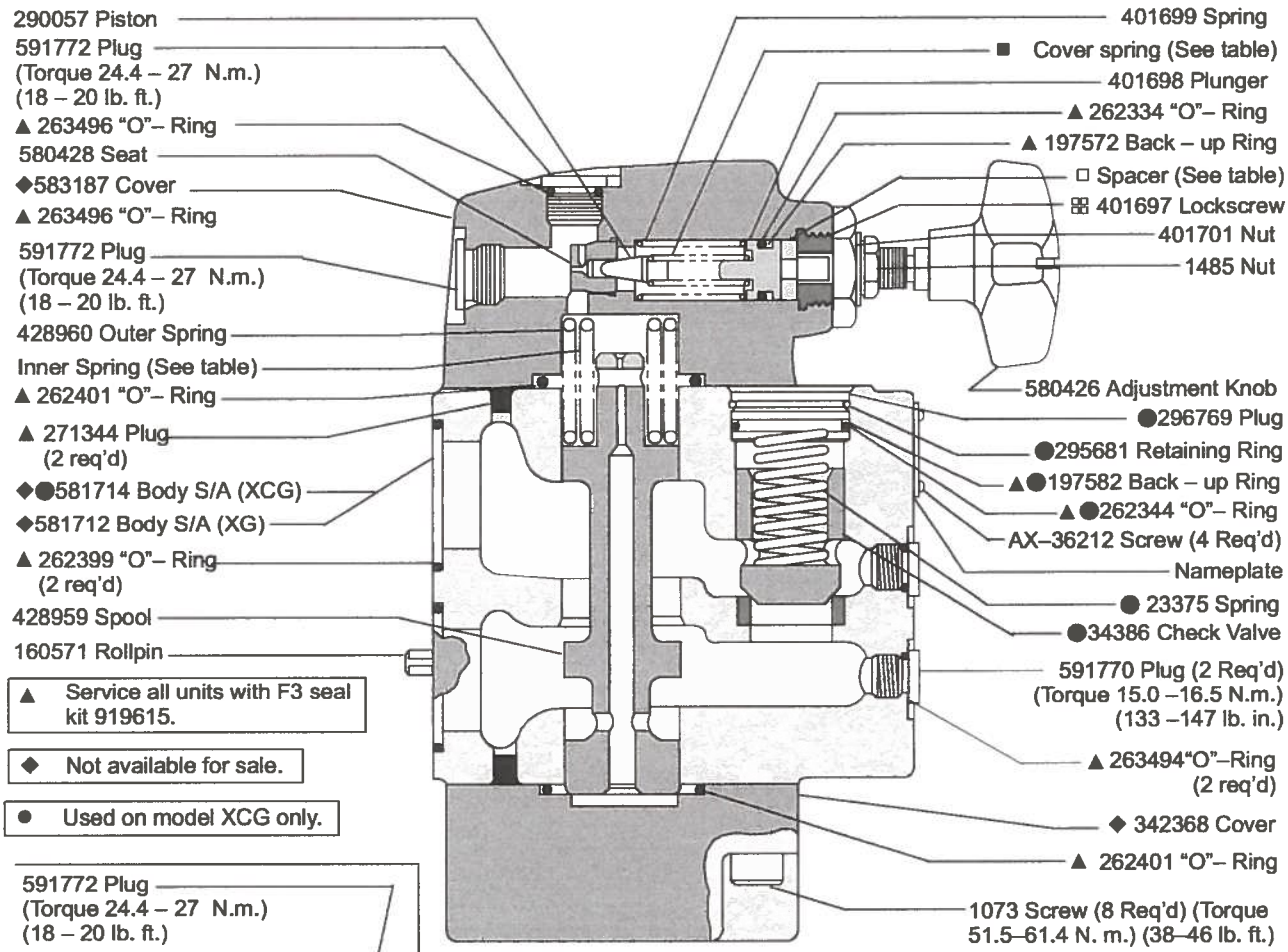
Service Data

Vickers®

Pressure Controls

Pressure Reducing Valves

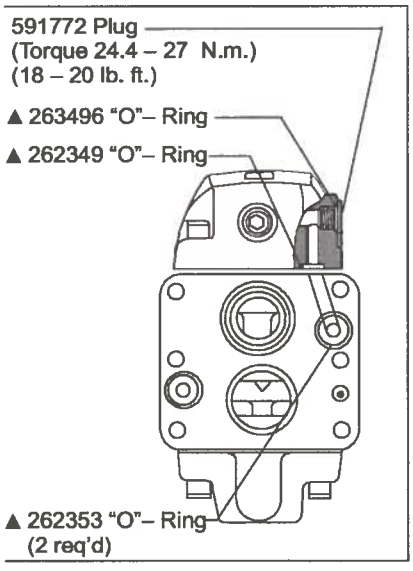
X(C)G - 10 - ** - 30


290057 Piston
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 263496 "O"– Ring
580428 Seat
◆583187 Cover
▲ 263496 "O"– Ring
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
428960 Outer Spring
Inner Spring (See table)
▲ 262401 "O"– Ring
▲ 271344 Plug (2 req'd)
◆●581714 Body S/A (XCG)
◆581712 Body S/A (XG)
▲ 262399 "O"– Ring (2 req'd)
428959 Spool
160571 Rollpin
401699 Spring
■ Cover spring (See table)
401698 Plunger
▲ 262334 "O"– Ring
▲ 197572 Back – up Ring
□ Spacer (See table)
⊞ 401697 Lockscrew
401701 Nut
1485 Nut
580426 Adjustment Knob
●296769 Plug
●295681 Retaining Ring
▲●197582 Back – up Ring
▲●262344 "O"– Ring
AX–36212 Screw (4 Req'd)
Nameplate
● 23375 Spring
●34386 Check Valve
591770 Plug (2 Req'd) (Torque 15.0 –16.5 N.m.) (133 –147 lb. in.)
▲ 263494"O"–Ring (2 req'd)
◆ 342368 Cover
▲ 262401 "O"– Ring
1073 Screw (8 Req'd) (Torque 51.5–61.4 N. m.) (38–46 lb. ft.)

▲ Service all units with F3 seal kit 919615.

◆ Not available for sale.

● Used on model XCG only.



⊞ **NOTE**
Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.

Model	Inner Spring	Cover spring	Spacer	Pressure range P.S.I.	Rated flow USGPM
X(C)G–10–1B–30	—	2280	—	100-1000	25
				165-1000	50
X(C)G–10–1F–30	428961			225-1000	75
X(C)G–10–2B–30	—	583937		100-2000	25
				165-2000	50
X(C)G–10–2F–30	428961			225-2000	75
X(C)G–10–3F–30		401700	386715	225-2850	75

Model Code

(F3) - X(C)G - 10 - ** -30

1 2 3 4 5 6 7 8

1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

X - Pressure reducing valve

3 Integral Check Valve

Omitted - No check valve

4 Manifold or Subplate Mounted

5 Nominal Valve Size

10 - 1-1/4 inch

6 Maximum Adjustable Pressure

1 - 1000 PSI
2 - 2000 PSI
3 - 2800 PSI

7 Maximum Rated Flow Capacity

B - 50 USgpm
F - 75 USgpm

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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Service Data

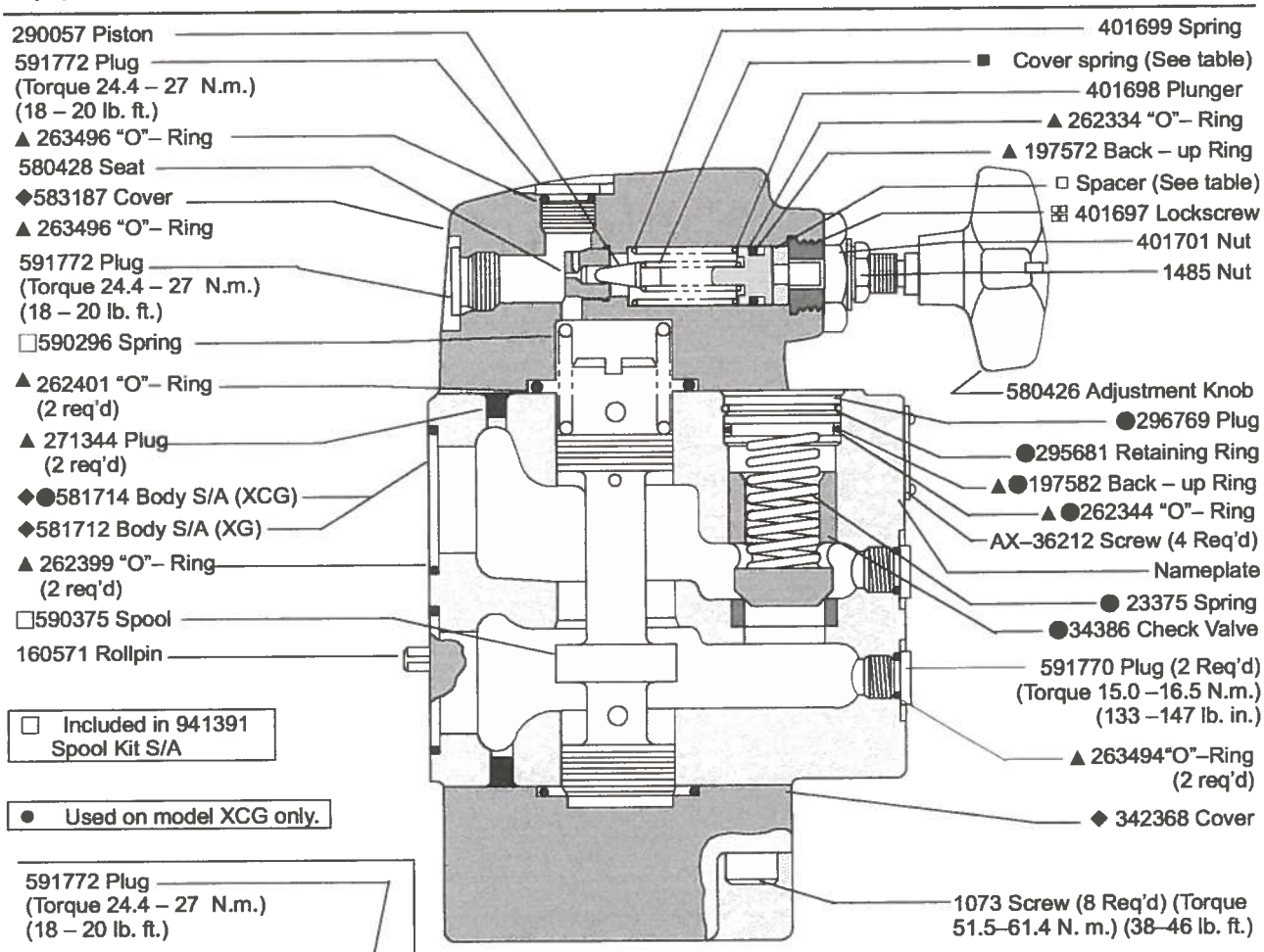
Vickers®

Pressure Controls

EATON

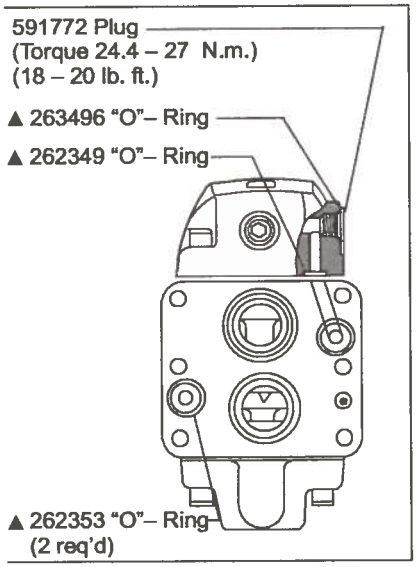
Pressure Reducing Valves

X(C)G - H10 - * - 30


290057 Piston
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 263496 "O"– Ring
580428 Seat
◆583187 Cover
▲ 263496 "O"– Ring
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
□590296 Spring
▲ 262401 "O"– Ring (2 req'd)
▲ 271344 Plug (2 req'd)
◆●581714 Body S/A (XCG)
◆581712 Body S/A (XG)
▲ 262399 "O"– Ring (2 req'd)
□590375 Spool
160571 Rollpin
401699 Spring
■ Cover spring (See table)
401698 Plunger
▲ 262334 "O"– Ring
▲ 197572 Back – up Ring
□ Spacer (See table)
⊞ 401697 Lockscrew
401701 Nut
1485 Nut
580426 Adjustment Knob
●296769 Plug
●295681 Retaining Ring
▲●197582 Back – up Ring
▲●262344 "O"– Ring
AX–36212 Screw (4 Req'd)
Nameplate
● 23375 Spring
●34386 Check Valve
591770 Plug (2 Req'd) (Torque 15.0 –16.5 N.m.) (133 –147 lb. in.)
▲ 263494"O"–Ring (2 req'd)
◆ 342368 Cover
1073 Screw (8 Req'd) (Torque 51.5–61.4 N. m.) (38–46 lb. ft.)

□ Included in 941391 Spool Kit S/A

● Used on model XCG only.



▲ Service all units with F3 seal kit 919852.

⊞ **NOTE**
Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.

◆ Not available for sale.

Model	Cover spring	Spacer	Pressure range P.S.I.
X(C)G–H10–1–30	2280	—	1000
X(C)G–H10–2–30	583937		2000
X(C)G–H10–3–30	401700	386715	2850

VICKERS

Model Code

(F3) - X(C)G - H 10 * -30

1 2 3 4 5 6 7 8

1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

X - Pressure reducing valve

3 Integral Check Valve

Omitted - No check valve

4 Manifold or Subplate Mounted

5 Nominal Valve Size

10 - 1-1/4 inch

6 High Flow

H - 140 USgpm

7 Maximum Adjustable Pressure

1 - 1000 PSI
2 - 2000 PSI
3 - 2800 PSI

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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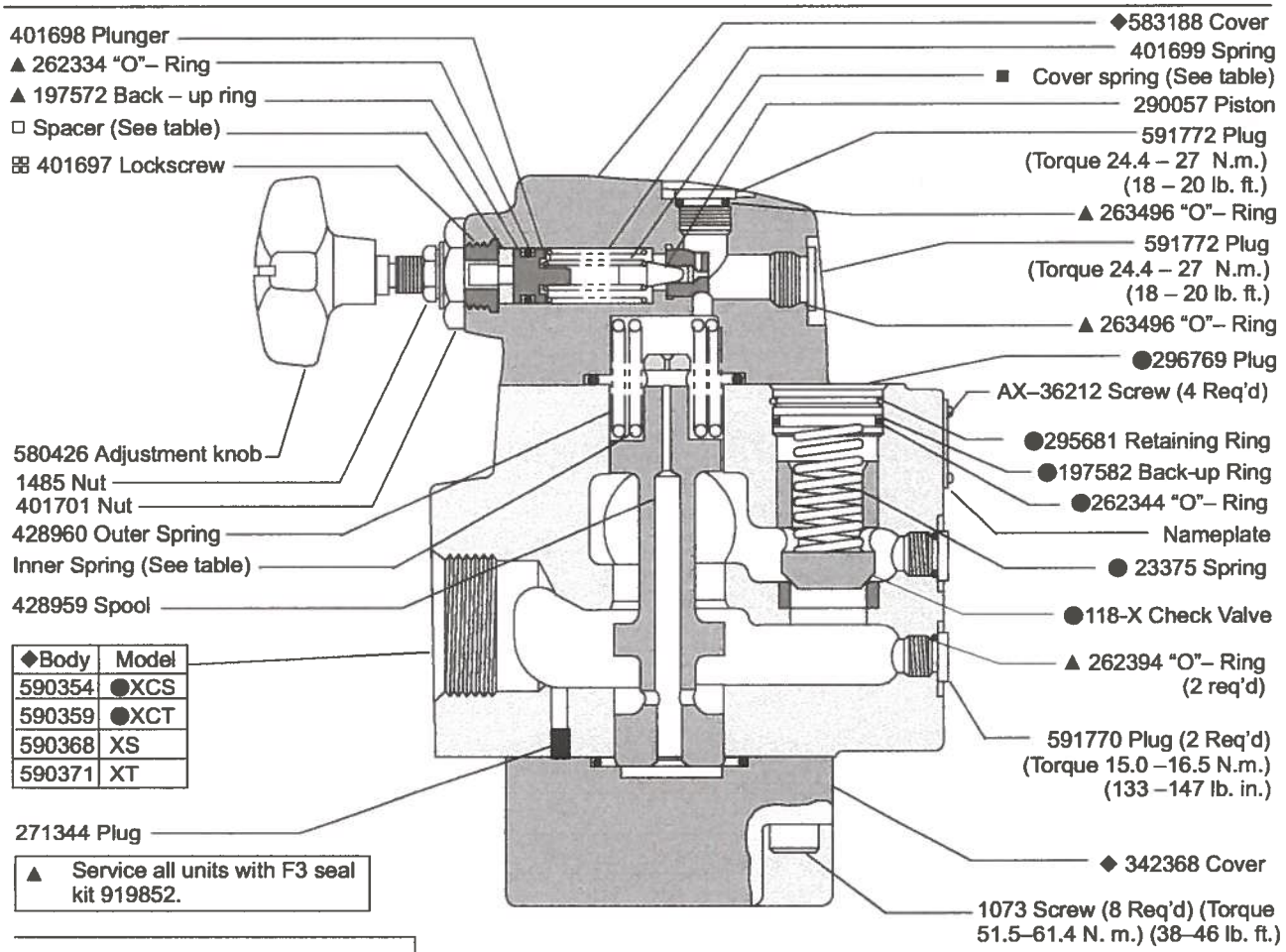
Service Data

Vickers®

Pressure Controls

Pressure Reducing Valves

X(C)S - 10 - ** - 30
X(C)T - 10 - ** - 30

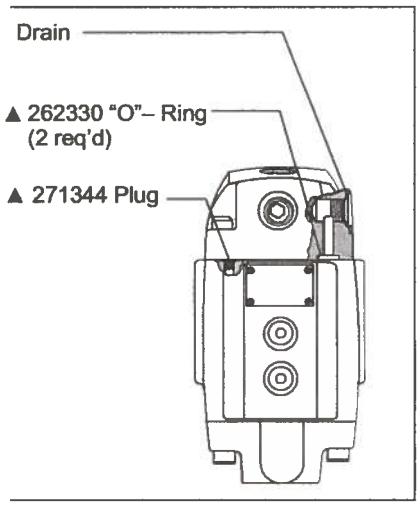

401698 Plunger
▲ 262334 "O"– Ring
▲ 197572 Back – up ring
□ Spacer (See table)
⊞ 401697 Lockscrew
580426 Adjustment knob
1485 Nut
401701 Nut
428960 Outer Spring
Inner Spring (See table)
428959 Spool
271344 Plug
◆583188 Cover
401699 Spring
■ Cover spring (See table)
290057 Piston
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 263496 "O"– Ring
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 263496 "O"– Ring
●296769 Plug
AX–36212 Screw (4 Req'd)
●295681 Retaining Ring
●197582 Back-up Ring
●262344 "O"– Ring
Nameplate
● 23375 Spring
●118-X Check Valve
▲ 262394 "O"– Ring (2 req'd)
591770 Plug (2 Req'd) (Torque 15.0 –16.5 N.m.) (133 –147 lb. in.)
◆ 342368 Cover
1073 Screw (8 Req'd) (Torque 51.5–61.4 N. m.) (38–46 lb. ft.)

◆Body	Model
590354	●XCS
590359	●XCT
590368	XS
590371	XT

▲ Service all units with F3 seal kit 919852.

◆ Not available for sale.

● Used on model XC* only.



⊞ NOTE
Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.

Model	Inner Spring	Cover spring	Spacer	Pressure range P.S.I.	Rated flow USGPM
X(C)*–10–1B–30	—	2280	—	100-1000	25
				165-1000	50
X(C)*–10–1F–30	428961			225-1000	75
X(C)*–10–2B–30	—	583937		100-2000	25
				165-2000	50
X(C)*–10–2F–30	428961			225-2000	75
X(C)*–10–3F–30		401700	386715	225-2850	75

Model Code

(F3) - X(C)* -10 -** -30**

1 2 3 4 5 6 7 8

1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

X - Pressure reducing valve

3 Integral Check Valve

Omitted - No check valve

4 Threaded Connections

S - 1.0625-12UN-2B Thd.
T - 1-1/4 inch NPTF Thd.

5 Nominal Valve Size

10 - 1-1/4 inch

6 Maximum Adjustable Pressure

1 - 1000 PSI
2 - 2000 PSI
3 - 2850 PSI

7 Maximum Rated Flow Capacity

B - 50 USgpm
F - 75 USgpm

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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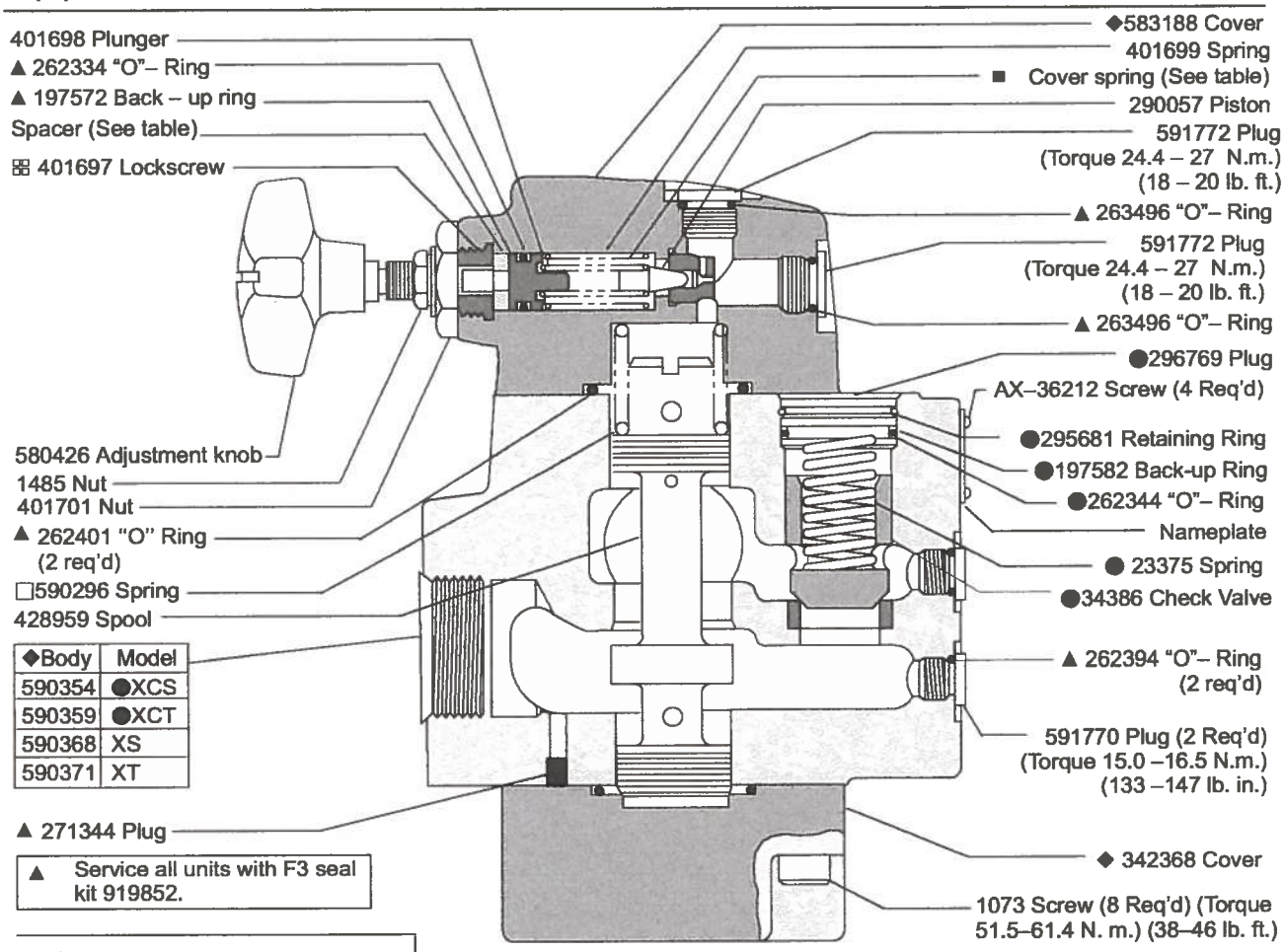
Service Data

Vickers®

Pressure Controls

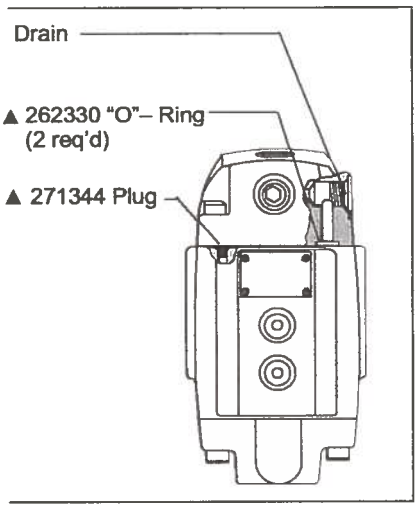
Pressure Reducing Valves

X(C)S - H10 - * - 30
X(C)T - H10 - * - 30


401698 Plunger
▲ 262334 "O"– Ring
▲ 197572 Back – up ring
Spacer (See table)
⊞ 401697 Lockscrew
580426 Adjustment knob
1485 Nut
401701 Nut
▲ 262401 "O" Ring (2 req'd)
□590296 Spring
428959 Spool
▲ 271344 Plug
◆583188 Cover
401699 Spring
■ Cover spring (See table)
290057 Piston
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 263496 "O"– Ring
591772 Plug (Torque 24.4 – 27 N.m.) (18 – 20 lb. ft.)
▲ 263496 "O"– Ring
●296769 Plug
AX–36212 Screw (4 Req'd)
●295681 Retaining Ring
●197582 Back-up Ring
●262344 "O"– Ring
Nameplate
● 23375 Spring
●34386 Check Valve
▲ 262394 "O"– Ring (2 req'd)
591770 Plug (2 Req'd) (Torque 15.0 –16.5 N.m.) (133 –147 lb. in.)
◆ 342368 Cover
1073 Screw (8 Req'd) (Torque 51.5–61.4 N. m.) (38–46 lb. ft.)

◆Body	Model
590354	●XCS
590359	●XCT
590368	XS
590371	XT

▲ Service all units with F3 seal kit 919852.



◆ Not available for sale.

● Used on model XC* only.

⊞ **NOTE**
Install lockscrew W/Stepped O. D. end toward spacer or plunger as shown.

□ Included in 941391 Spool Kit S/A

Model	Cover spring	Spacer	Pressure range P.S.I.
X(C)*–H10–1–30	2280	—	1000
X(C)*–H10–2–30	583937		2000
X(C)*–H10–3–30	401700	386715	2850

Model Code

(F3) - X(C)* - H10 - * -30

1 2 3 4 5 6 7 8

1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

X - Pressure reducing valve

3 Integral Check Valve

Omitted - No check valve

4 Threaded Connections

S - 1.0625-12UN-2B Thd.
T - 1-1/4 inch NPTF Thd.

5 High Flow

H - 140 USgpm

6 Nominal Valve Size

10 - 1-1/4 inch

7 Maximum Adjustable Pressure

1 - 1000 PSI
2 - 2000 PSI
3 - 2850 PSI

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

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Service Data

Vickers®

Relief Valves

EATON

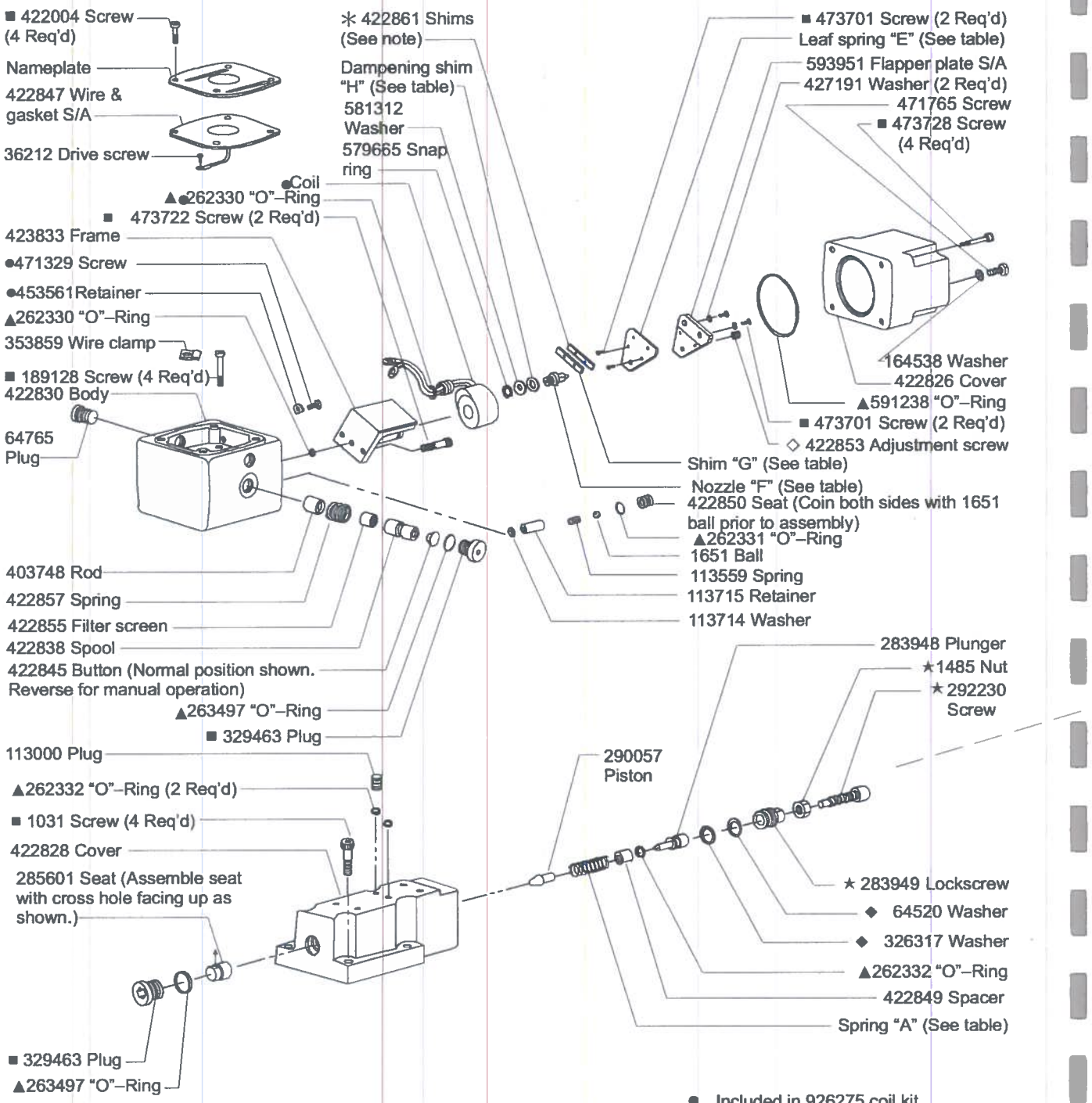
Remote Electrically Modulated Relief Valves

CGE–06–1–22
CGE–06–3(V)–22–(S6)(S7)

VICKERS

Revised 00–01–96

I–3675–S



■ Screw	■ Plug	Torque (N.m.)	Torque (lb. in.)	Torque (lb. ft.)
1031	———	12.6 Max.	112 Max.	———
189128		4.7 Max	42 Max	
———	329463	40.7 – 47.5	360 – 420	30 – 35
	343740	14.7 – 18.1	130 – 160	
422004		0.7 – 0.9	6 –8	
473701	———	1.4 – 1.6	12 – 14	———
473722		4.0 – 4.5	35 – 40	
473728		4.0 – 4.5	35 – 40	

- ● Included in 926275 coil kit.
- ▲ Included in F3 seal kit 920081. (All seals, except interface, are F3. Use the F3 seal kit to service all units.)
- □ At assembly, adjust screw until dimension between screw and nozzle is .004 – .005 in. or 0.10 – 0.13 mm.
- ■ Included in Screw/Plug/Nozzle Torque tables.
- ✳ Number of shims are factory selected to obtain maximum pressure setting.
- ◇ Not available for sale
- ★ Coat with oil prior to assembly
- ◆ Arrange for correct pressure adjustment range

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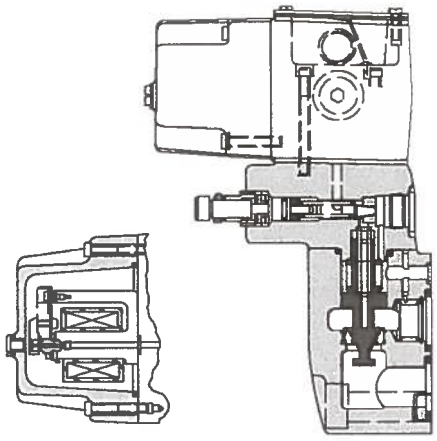
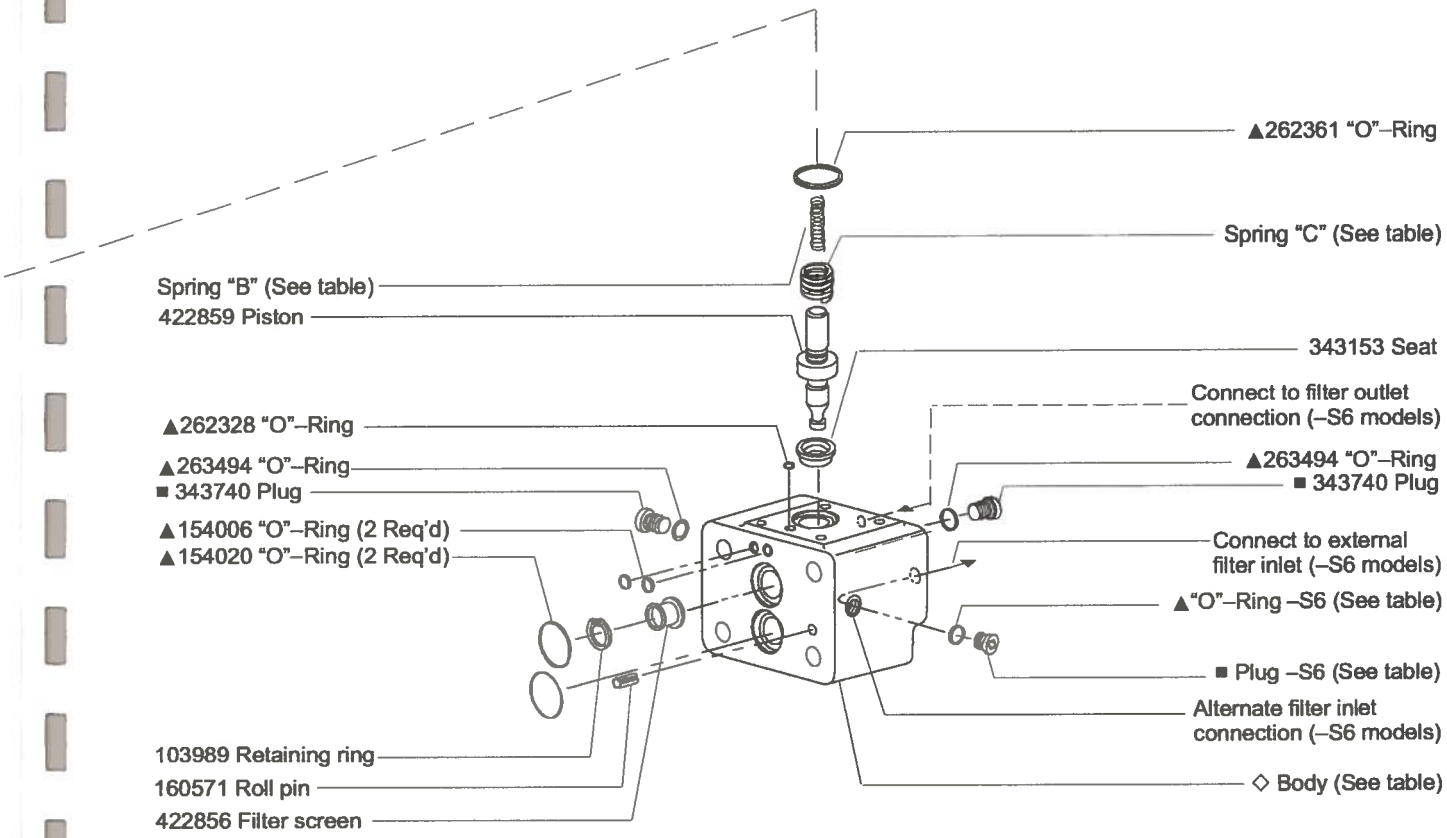
45° Cross sectional view of nozzle, flapper and coil.



■ Nozzle "F"	Torque (lb. in.)	Torque (N.m.)
424189	11–13	1.2–1.5
422842	13–15	1.5–1.7

Model	Pressure range	Spring "A"	Spring "B"	Spring "C"	Leaf spring "E"	■ Nozzle "F"	Shim "G"	Damping shim "H"
CGE–06–1–22	75–1000 psi	2280	2077	———	424188	424189	424190	424724
CGE–06–3–22	150–3000 psi	2281	2077	———	422835	422842	422839	———
CGE–06–3V–22	300–3000 psi	2281	———	184458	422835	422842	422839	———



Model	◇ Body	▲ "O"–Ring	▲ Plug	External 3000 PSI 35 micron filter Req'd
CGE–06–**–22	597718			No
CGE–06–**–22–S6	597831	263494	343740	Yes

Model Code

(F3) - C G E - 06 - 3 (V) - 22 - S*

1 2 3 4 5 6 7 8 9

1 Viton seals
(Omit if not required)

2 Relief valve

3 Subplate mounted

4 Remote electrically modulated

5 Valve size

06 – 60 series ($^3/_4$" NOM.)

6 Pressure rating (psi)

1 – 75 – 1000 (70 bar)
3 – 150 – 3000 (210 bar)
3V – 300 – 3000 (210 bar)

7 "V" – Optional high venting pressure feature. Omit if not required. (for 3000 psi (210 bar) pressure models only)

8 Design

9 S6 – External 35 micron pilot filter. (Furnished by customer)
S7 – Viton seals with 35 micron filter (Early models)

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

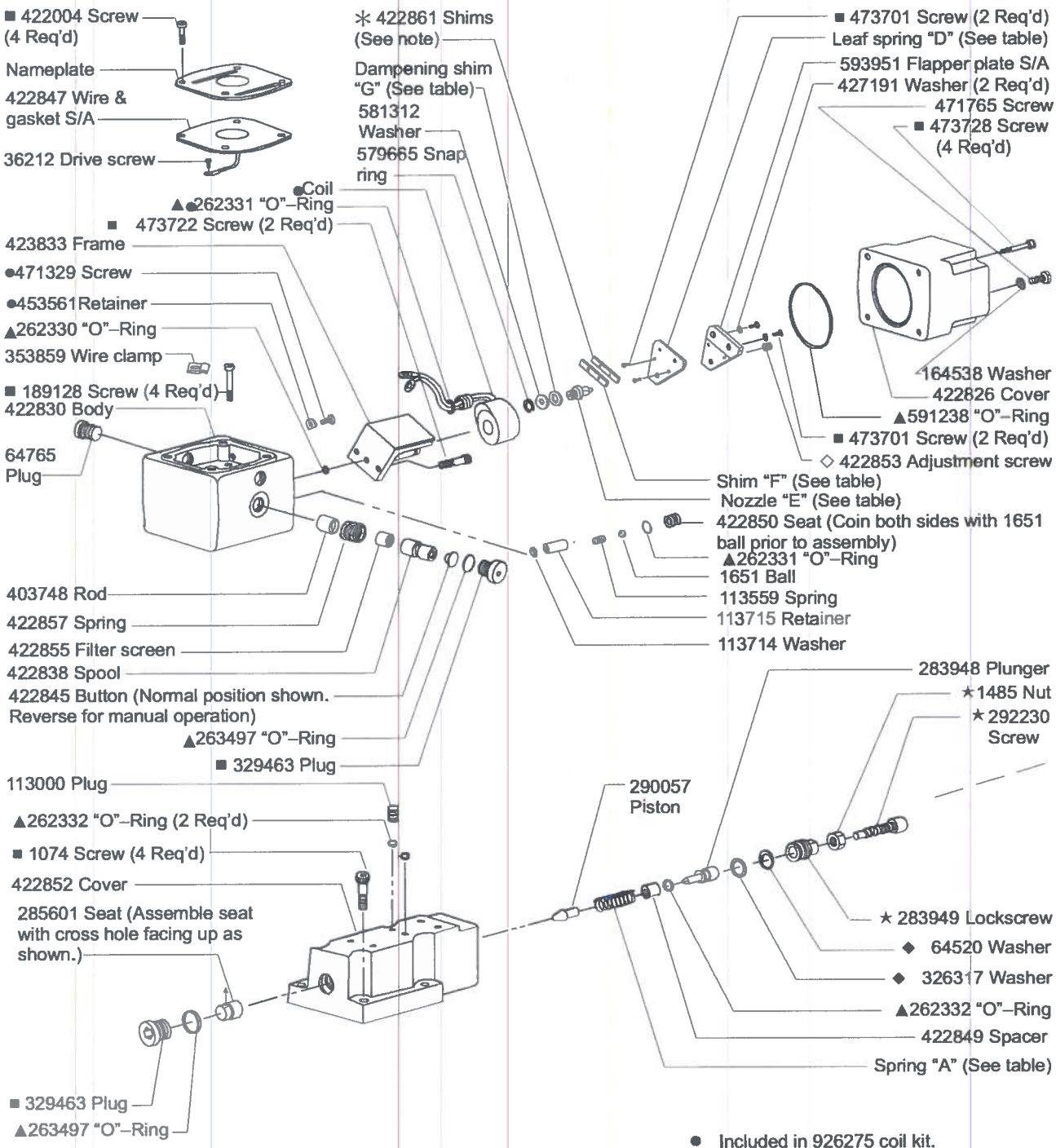
Remote Electrically Modulated Relief Valves

CGE–10–1–22
CGE–10–3(V)–22–(S6)

VICKERS

Revised 00–01–96

I–3676–S



■ Screw	■ Plug	Torque (N.m.)	Torque (lb. in.)	Torque (lb. ft.)
1074	———	36.0 Max.	318 Max.	26.5
189128		4.7 Max	42 Max	———
———	329463	40.7 – 47.5	360 – 420	30 – 35
	343740	14.7 – 18.1	130 – 160	
422004		0.7 – 0.9	6 –8	
473701	———	1.4 – 1.6	12 – 14	———
473722		4.0 – 4.5	35 – 40	
473728		4.0 – 4.5	35 – 40	

- ● Included in 926275 coil kit.
- ▲ Included in F3 seal kit 920082. (All seals, except interface, are F3. Use the F3 seal kit to service all units.)
- □ At assembly, adjust screw until dimension between screw and nozzle is .004 – .005 in. or 0.10 – 0.13 mm.
- ■ Included in Screw/Plug/Nozzle Torque tables.
- ✳ Number of shims are factory selected to obtain maximum pressure setting.
- ◇ Not available for sale
- ★ Coat with oil prior to assembly
- ◆ Arrange for correct pressure adjustment range

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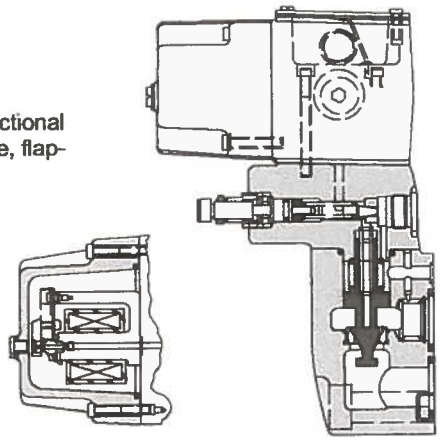
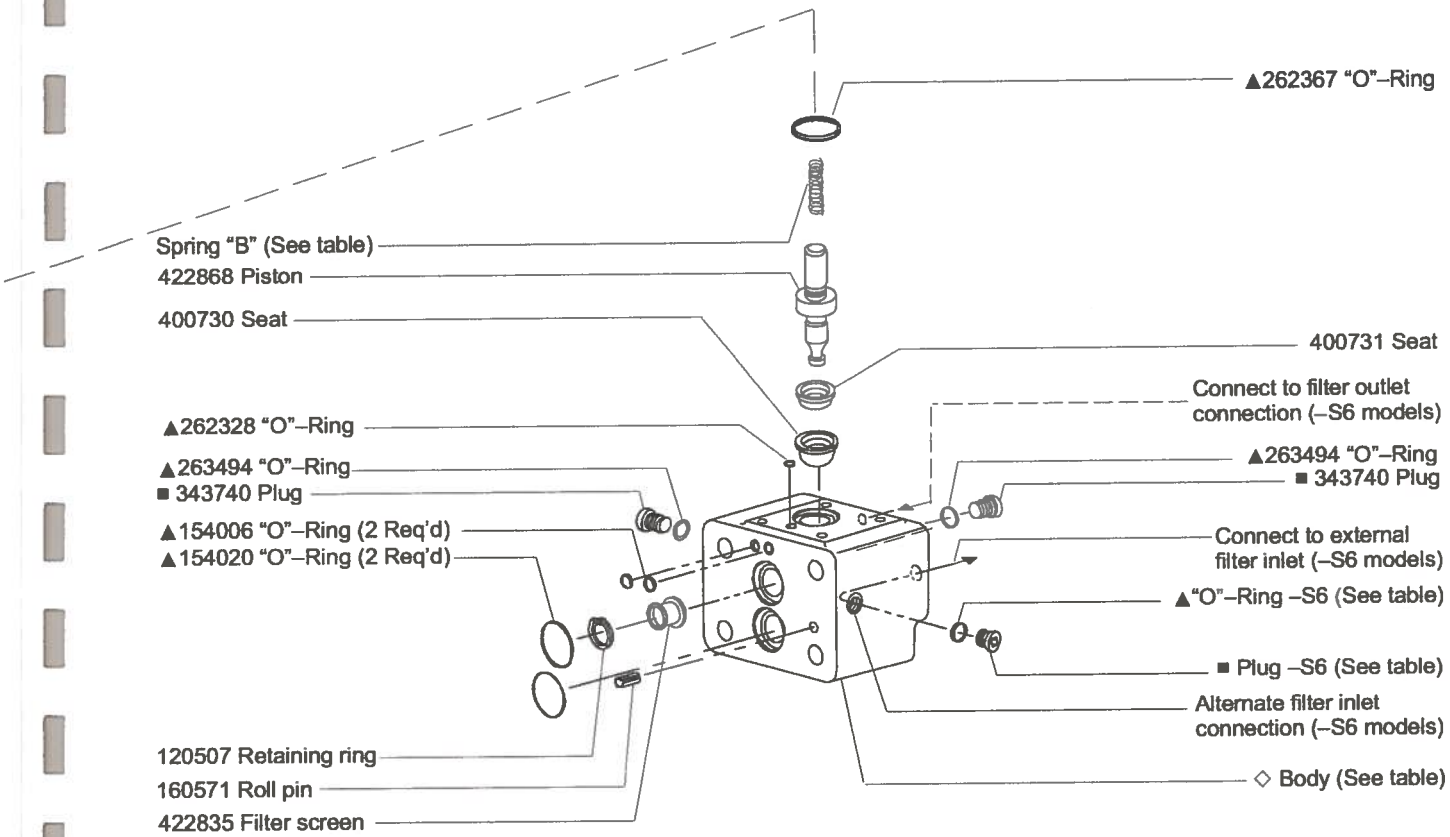
45° Cross sectional view of nozzle, flapper and coil.



■ Nozzle "E"	Torque (lb. in.)	Torque (N.m.)
424189	11–13	1.2–1.5
422842	13–15	1.5–1.7

Model	Pressure range	Spring "A"	Spring "B"	Leaf spring "D"	■ Nozzle "E"	Shim "F"	Damping shim "G"
CGE–10–1–22	75–1000 psi	2280	424202	424188	424189	424190	424724
CGE–10–3–22	150–3000 psi	2281	424731	422835	422842	422839	——
CGE–10–3V–22	300–3000 psi	2281	291821	422835	422842	422839	——



Model	◇ Body	▲ "O"–Ring	▲ Plug	External 3000 PSI 35 micron filter Req'd
CGE–10–**–22	597719			No
CGE–10–**–22–S6	597832	263494	343740	Yes

Model Code

(F3) - C G E - 10 - 3 (V) - 22 -(S6)

1 2 3 4 5 6 7 8 9

1 **Viton seals**
(Omit if not required)

2 **Relief valve**

3 **Subplate mounted**

4 **Remote electrically modulated**

5 **Valve size**

10 – 100 series ($1^1/_4$" NOM.)

6 **Pressure rating (psi)**

1 – 75 – 1000 (70 bar)
3 – 150 – 3000 (210 bar)
3V – 300 – 3000 (210 bar)

7 **"V"** – Optional high venting pressure feature. Omit if not required. (for 3000 psi (210 bar) pressure models only)

8 **Design**

9 **S6** – External 35 micron pilot filter. (Furnished by customer)

Printed in U.S.A.

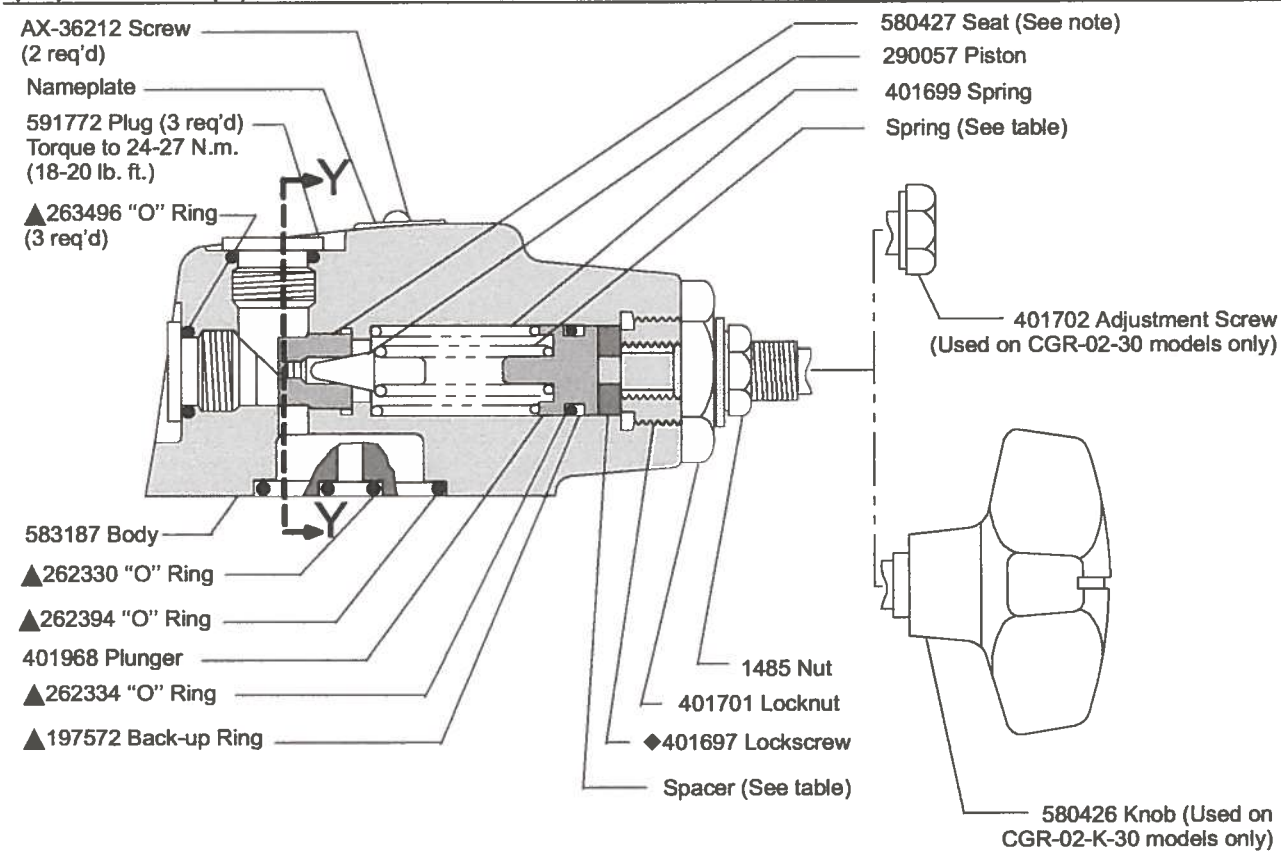
Service Data

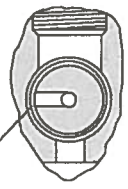
Vickers®

Relief Valves

Remote Control Relief Valves

(F3) CGR-02-*(K)-30





Y-Y

Note

Assemble 580427 seat with cross hole in position shown or 180° from position shown.

◆Install lockscrew with stepped O.D. end toward spacer or plunger as shown.

Model	Max. Adj. Pressure	Spring	Spacer
CGR-02-B-(K)-30	1000 psi	2280	—
CGR-03-C-(K)-30	2000 psi	583937	
CGR-02-F-(K)-30	3000 psi	401700	386715

▲Service all units w/F3 Seal Kit 919854

Model Code

(F3) - CGR - 02 - * - (K) - 30

1 2 3 4 5 6

1 Seals

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

CGR - 0-3000 psi Manifold or subplate mounted relief valve, remote control

3 Size

02 - 1/4 inch

4 Maximum Adjustable Pressure

B - 1000 psi
C - 2000 psi
F - 3000 psi

5 Adjustment

K - Optional knob
(Omit for hex head adjustment screw)

6 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Service Data

Vickers®

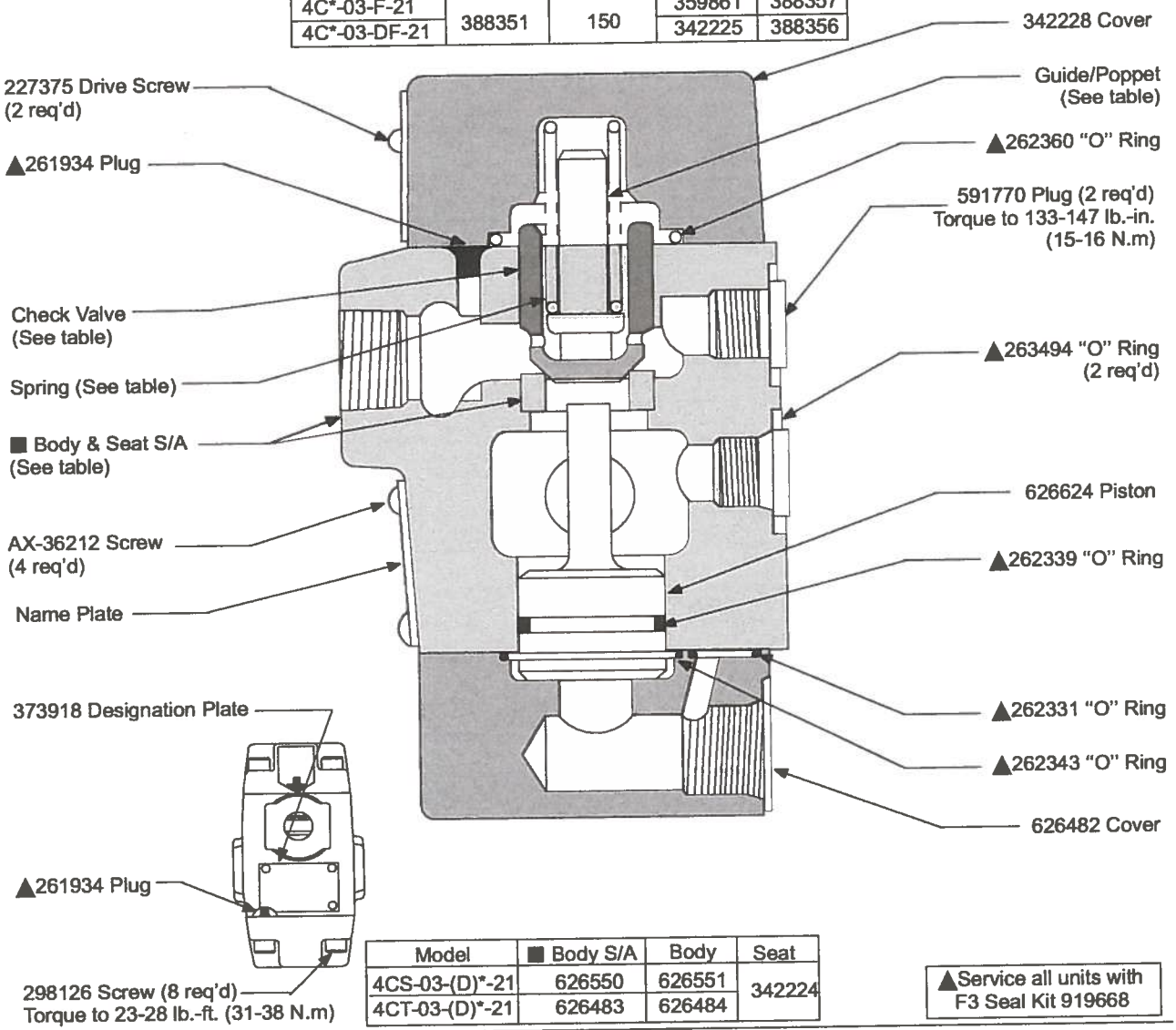
Check Valves

EATON

Pilot Operated Check Valve

4CT-03-(D)*-21
4CS-03-(D)*-21
4CG-03-(D)*-21

Model	Spring	Pressure PSI	Check-Valve	Guide/ Poppet
4C*-03-A-21	352439	30	359861	359858
4C*-03-DA-21			342225	352440
4C*-03-B-21	389302	50	359861	359858
4C*-03-DB-21			342225	352440
4C*-03-C-21	388350	75	359861	359858
4C*-03-DC-21			342225	352440
4C*-03-F-21	388351	150	359861	388357
4C*-03-DF-21			342225	388356



Model	■ Body S/A	Body	Seat
4CS-03-(D)*-21	626550	626551	342224
4CT-03-(D)*-21	626483	626484	

▲Service all units with F3 Seal Kit 919668

Model Code

(F3) - 4C * - 03 - (D) * - 21

1 2 3 4 5 6 7

1 Seals

(F3) - Seals for mineral oil and fire resistant fluids

2 Model Series

4C - Pilot operated check valve

3 Connection

G - Subplate mounted
S - SAE straight thread connection
T - NPTF threaded connection

4 Series

03 - 30

5 Features

D - Decompression
(Omit for no decompression)

6 Pressure Range

A - 30 PSI
B - 50 PSI
C - 75 PSI
D - 150 PSI

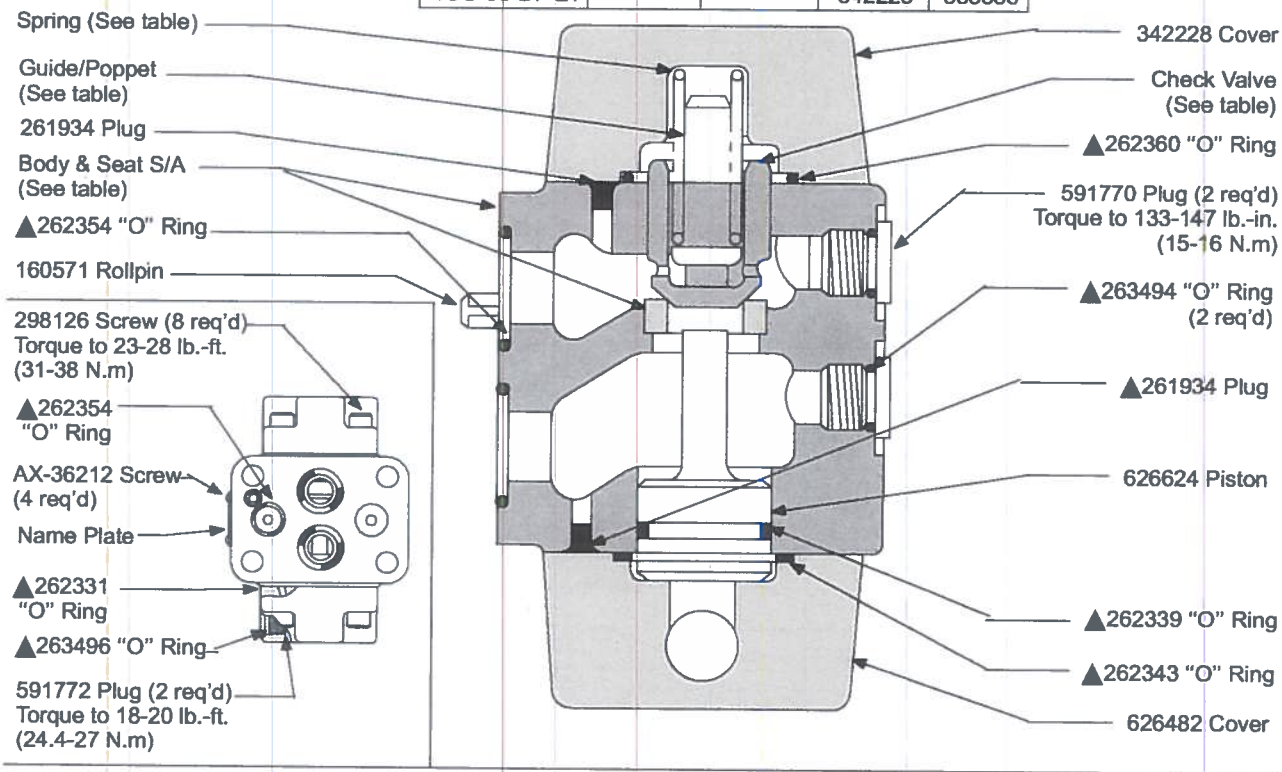
7 Design

4CG-03-(D)*-21

▲Service all units with F3 Seal Kit 919671

626485 Body & Seat S/A Includes:
342224 Seat
626486 Body

Model	Spring	Pressure PSI	Check-Valve	Guide/ Poppet
4CG-03-A-21	352439	30	359861	359858
4CG-03-DA-21			342225	352440
4CG-03-B-21	389302	50	359861	359858
4CG-03-DB-21			342225	352440
4CG-03-C-21	388350	75	359861	359858
4CG-03-DC-21			342225	352440
4CG-03-F-21	388351	150	359861	388357
4CG-03-DF-21			342225	388356



For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

Multi–Pressure Relief Valves

CG-(H)-06-*(V)-(P)(*)DG(L)-8C-(H)-(*)-20
CG-(H)-10-*(V)-(P)(*)DG(L)-8C-(H)-(*)-20

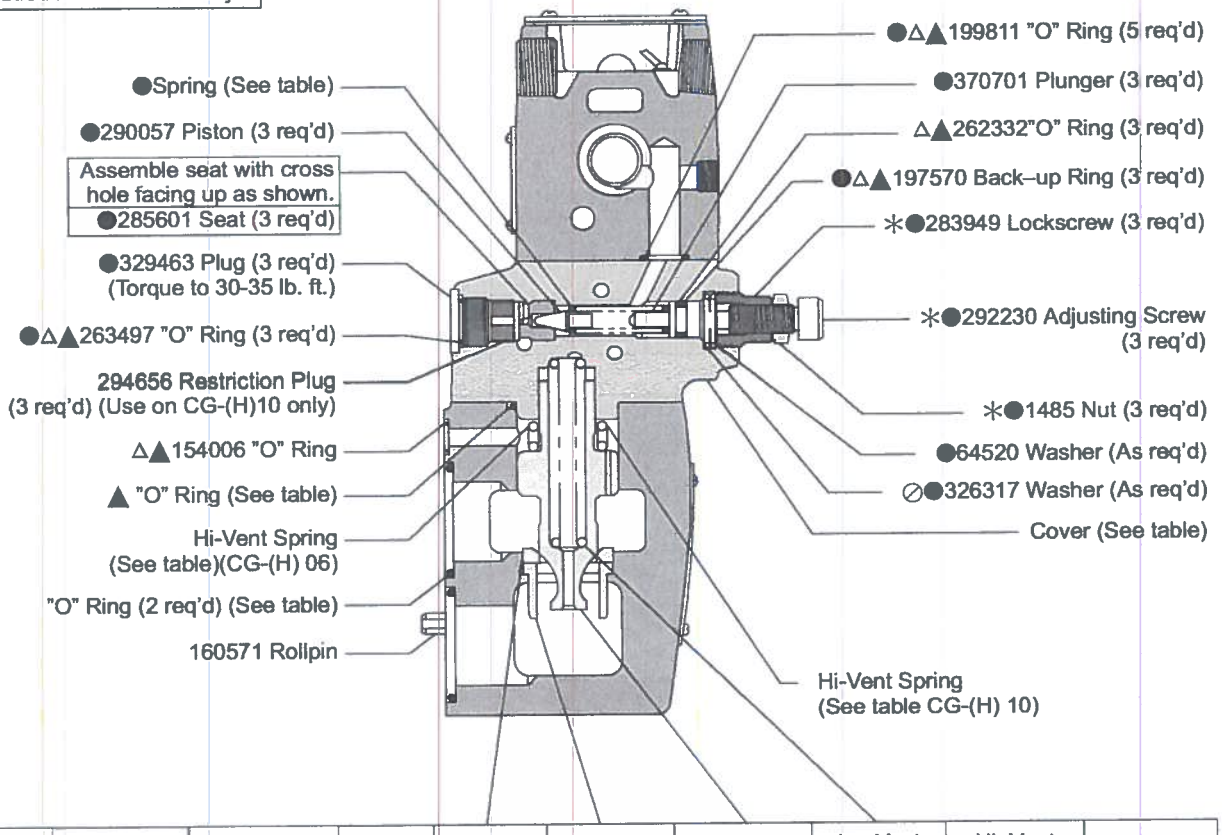
VICKERS

Revised 12/01/87

I-3684-S

Model	Head #1		Head #2		Head #3		●CG-(H)06 Cover S/A
	● Spring	Pressure Range PSI	● Spring	Pressure Range PSI	● Spring	Pressure Range PSI	
CG-(H)06/(H)10-CBF	583937	500 - 2000	2280	125 - 1000	2281	1500 - 3000	942198
CG-(H)06/(H)10-CEB			VENT	125 - 1000	2280	125 - 1000	—
CG-(H)06/(H)10-CBC			2280	—	583937	500 - 2000	942202
CG-(H)06/(H)10-FFB	2281	1500 - 3000	2281	1500 - 3000	2280	125 - 1000	942326

●Included in cover assembly


●Spring (See table)
●290057 Piston (3 req'd)
Assemble seat with cross hole facing up as shown.
●285601 Seat (3 req'd)
●329463 Plug (3 req'd) (Torque to 30-35 lb. ft.)
●Δ▲263497 "O" Ring (3 req'd)
294656 Restriction Plug (3 req'd) (Use on CG-(H)10 only)
Δ▲154006 "O" Ring
▲ "O" Ring (See table)
Hi-Vent Spring (See table)(CG-(H) 06)
"O" Ring (2 req'd) (See table)
160571 Rollpin
●Δ▲199811 "O" Ring (5 req'd)
●370701 Plunger (3 req'd)
Δ▲262332"O" Ring (3 req'd)
●Δ▲197570 Back–up Ring (3 req'd)
∗●283949 Lockscrew (3 req'd)
∗●292230 Adjusting Screw (3 req'd)
∗●1485 Nut (3 req'd)
●64520 Washer (As req'd)
⊘●326317 Washer (As req'd)
Cover (See table)
Hi-Vent Spring (See table CG-(H) 10)

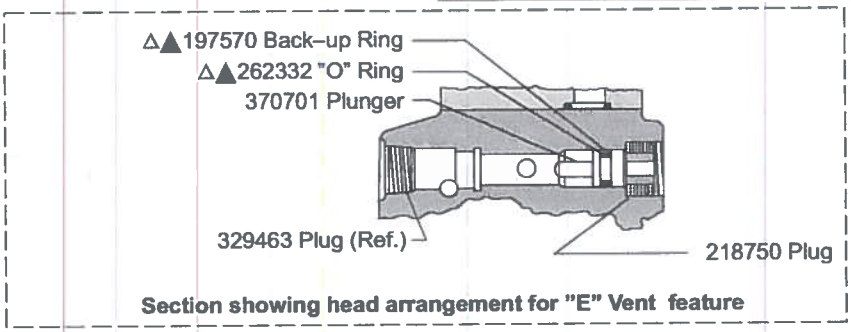
Model	"O" Ring	"O" Ring (2 req'd)	Body	Seat	Sleeve	Hydro Cone	Lo–Vent Spring	Hi–Vent Spring	●Cover
CG-06	●▲262361	▲154020	580456	343153	—	343154	2077	184458	370664
CG-H06				589473	589472				
CG-10	●Δ262367	Δ154024	581703	283954	—	283952	291822	291821	370669
CG-H10				587996	400730				

⊘This part used at final test to obtain correct pressure range.

Use either a Lo-Vent or Hi-Vent spring as shown. Do not use both.

∗Note

Coat 292330 Adjusting Screw, 283949 Lockscrew, and 1485 Locknut with oil prior to assembly.



Section showing head arrangement for "E" Vent feature

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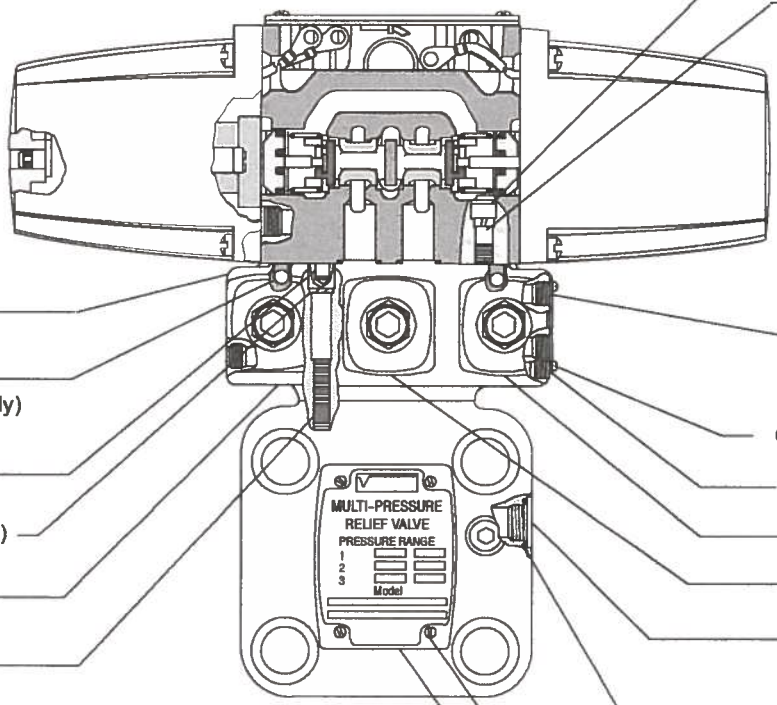
Insta–plug connectors for DG4S4 Pilot Stage are shown on drawing I–3487–S.

Oil immersed solenoid information is shown on drawing I-3498-S.

WARNING

Do not use other than a DG4S4-018C-*-50 directional valve as the pilot for this relief valve. Use of a different pilot can block the relief valve causing excessive system pressure.

DG4S4-018C-*-50 Pilot Valve
(Refer to I-3477-S
for parts information)



1034 Screw (4 req'd)
68907 Lockwasher (4 req'd)
Cover (See table)
●1649 Ball (2 req'd) (CG-(H)06 only)
140508 Rollpin
Lockwasher (See table)
Head #1
Screw (See table)
●113000 Plug (5 req'd) (CG-(H)06) (7 req'd) (CG-(H)10)
●227405 Screw (4 req'd)
●370839 Warning Plate
Head #3
Head #2
343740 Plug (2 req'd) (Torque 130-160 lb. in.)
Δ▲263494 "O" Ring (2 req'd)
AX-36212 Screw (4 req'd)
Nameplate

▲Included in (F3)CG-(H)06 Seal Kit 919684

ΔIncluded in (F3)CG-(H)10 Seal Kit 919685

All seals, except directional valve & relief valve interface seals, are F3. Use F3 seal kit to service all units.

Model Code

(F3) - CG - (H) ** - * (V) - (P) (*) DG(L) - 8 C - (H) - (*) - 20

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

CG - Relief valve, manifold or subplate mounted

3 Flow

H - High flow

4 Nominal Size

06 - ¾"
10 - 1¼"

5 Pressure Range PSI
(For head #1, #2 & #3)

B - 125 - 1000 PSI
C - 500 - 2000 PSI
F - 1500 - 3000 PSI
E - Vent

6 Vent Spring

V - High vent spring
Omit - Low vent spring

7 Insta Plug
(Omit when not required)

P - Insta Plug feature

8 Plug
(Omit when not required)

A - With plug only
B - With plug and receptacle

9 Pilot Stage

D - Directional valve

10 Mounting

G - Manifold or subplate mounted

11 Solenoid Indicator Light

L - Solenoid indicator lights
Omit - Without lights

12 Spool Type

8 - Tandem open center crossover spool

13 Pilot Valve Type

C - Spring centered

14 Solenoid

H - Oil immersed solenoid
Omit - Standard solenoid

15 Solenoid Voltage

Omit - Standard voltage 115AC 60

16 Design

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP, OFR, and OFRS series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

Multi-Pressure Relief Valves

CG-(H)-06-*(V)-(P)*DG(L)-0*-(H)-*-20
CG-(H)-10-*(V)-(P)*DG(L)-0*-(H)-*-20

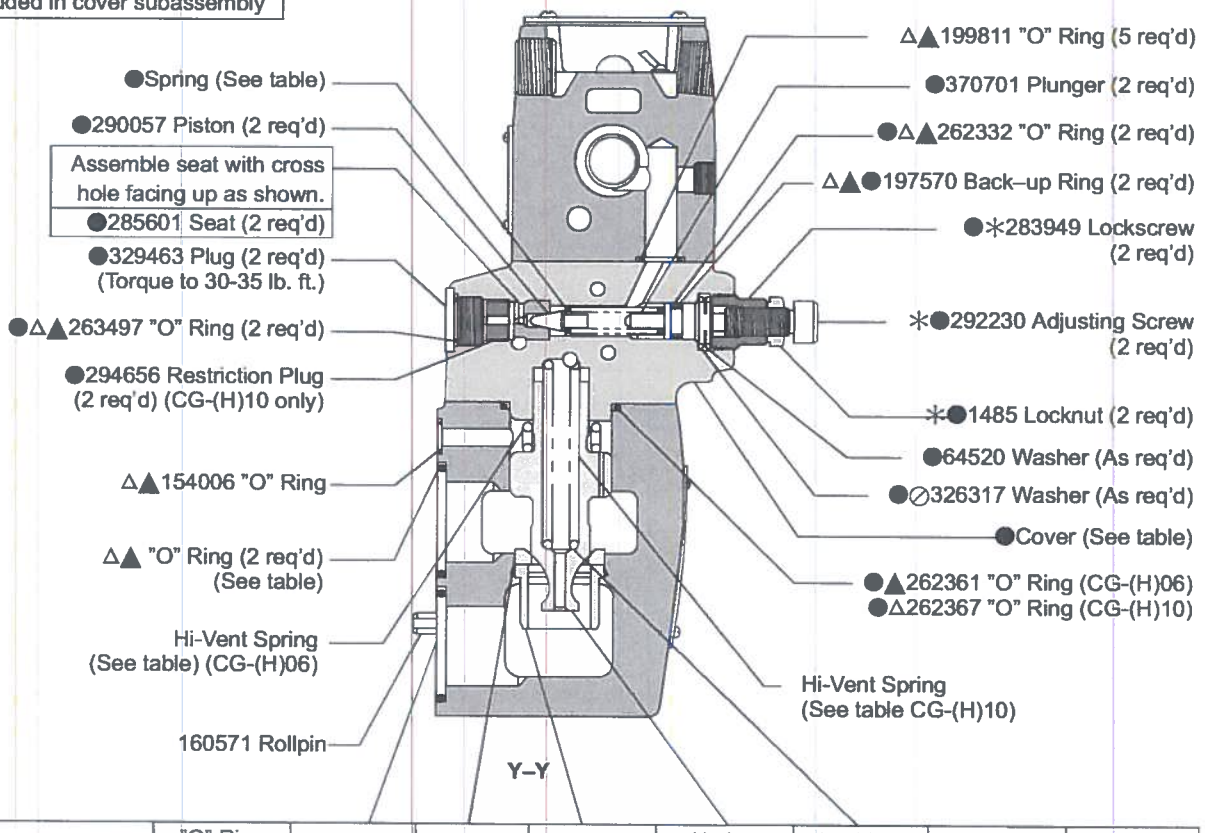
VICKERS

Revised 11/01/85

I-3685-S

Model	Head #1		Head #3		●CG-(H)06 Cover S/A	●CG-(H)10 Cover S/A
	Spring	Pressure Range PSI	Spring	Pressure Range PSI		
CG-(H)06/(H)10-BC	2280	125-1000	583937	500 - 2000	942155	942156
CG-(H)06/(H)10-BF			2281	1500 - 3000	———	———
CG-(H)06/(H)10-CF	583937	500–2000				

●Included in cover subassembly


●Spring (See table)
●290057 Piston (2 req'd)
Assemble seat with cross hole facing up as shown.
●285601 Seat (2 req'd)
●329463 Plug (2 req'd) (Torque to 30-35 lb. ft.)
●Δ▲263497 "O" Ring (2 req'd)
●294656 Restriction Plug (2 req'd) (CG-(H)10 only)
Δ▲154006 "O" Ring
Δ▲ "O" Ring (2 req'd) (See table)
Hi-Vent Spring (See table) (CG-(H)06)
160571 Rollpin
Y–Y
Δ▲199811 "O" Ring (5 req'd)
●370701 Plunger (2 req'd)
●Δ▲262332 "O" Ring (2 req'd)
Δ▲●197570 Back–up Ring (2 req'd)
●⁎283949 Lockscrew (2 req'd)
⁎●292230 Adjusting Screw (2 req'd)
⁎●1485 Locknut (2 req'd)
●64520 Washer (As req'd)
●⊘326317 Washer (As req'd)
●Cover (See table)
●▲262361 "O" Ring (CG-(H)06)
●Δ262367 "O" Ring (CG-(H)10)
Hi-Vent Spring (See table CG-(H)10)

Model	"O" Ring (2 req'd)	Body	Seat	Sleeve	Hydro Cone	Lo–Vent Spring	Hi–Vent Spring	Cover
CG-06	▲154020	580456	343153	———	343154	2077	184458	370666
CG-H06			589473	589472				
CG-10	Δ154024	581703	283954	———	283952	291822	291821	370671
CG-H10			587996	400730				

All seals, except directional valve & relief valve interface seals, are F3. Use F3 seal kit to service all units.

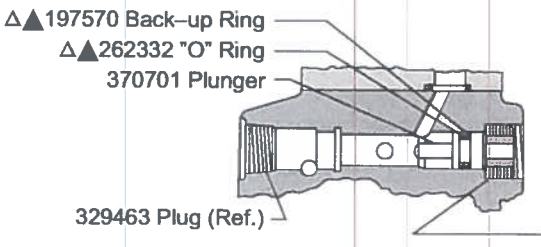
Use either a Lo-Vent or Hi-Vent spring as shown. Do not use both.

Included in F3CG-(H)06 Seal Kit 919684

Included in F3CG-(H)10 Seal Kit 919685

⊘This part used at final test to obtain correct pressure range.

⁎**Note**
Coat 292230 Adjusting Screw, 283949 Lock Screw and 1485 Lock-nut with oil prior to assembly.



Section showing head arrangement for "E" Vent feature

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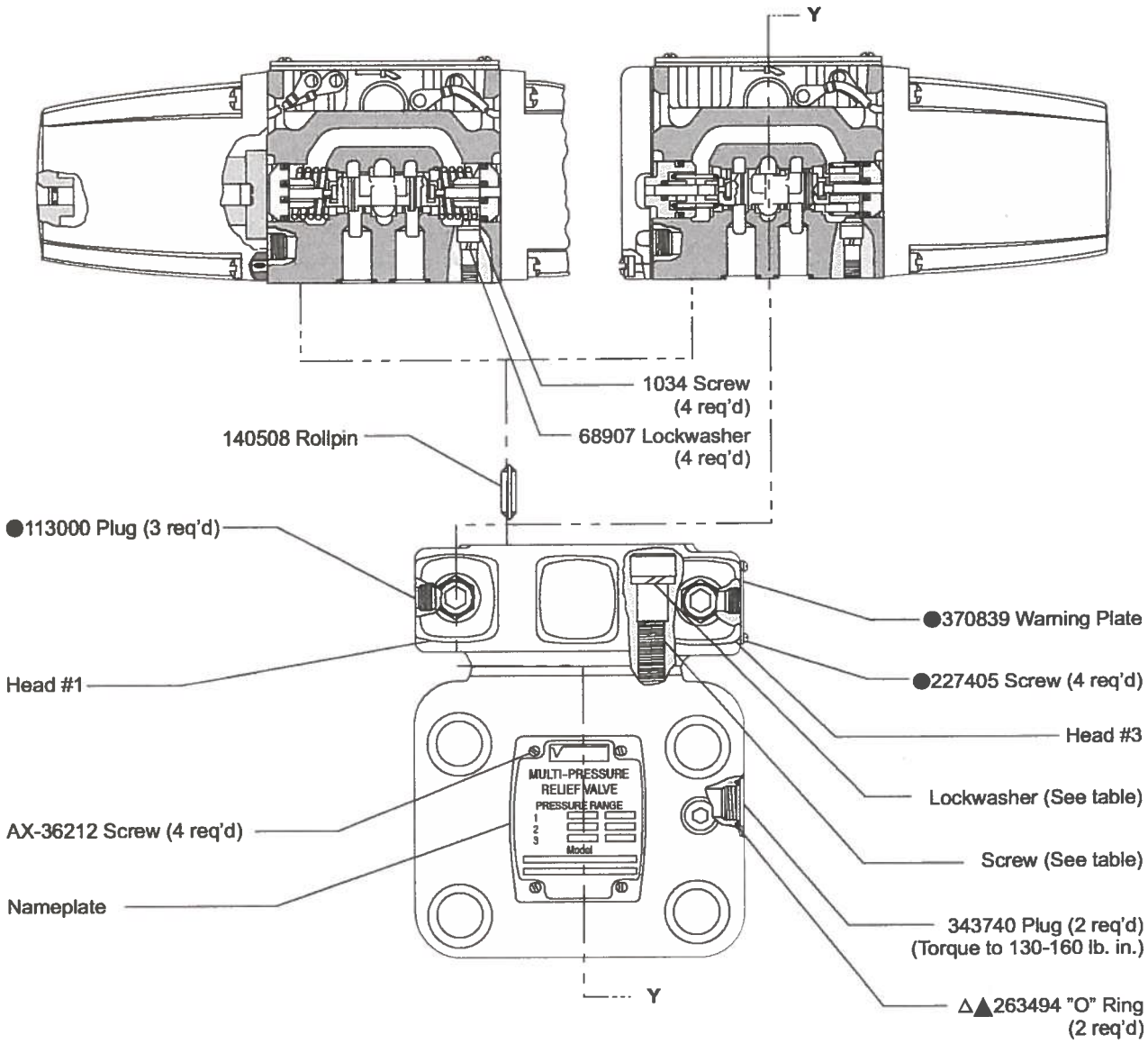
DG4S4-010N-*-51 Pilot Valve
(Refer to I-3471-S for parts information)

DG4S4-010A-*-50 Pilot Valve
(Refer to I-3478-S for parts information)



Model	Screw (4 req'd)	Lockwasher (4 req'd)
CG-(H)06	1036	68907
CG-(H)10	1076	68909

Insta-plug connectors for the DG4S4 pilot stage are shown on parts drawing I-3487-S.

WARNNG
Do not use other than a DG4S4-010A-*-50 or a DG4S4-010N-*-51 directional valve as the pilot for this relief valve. Use of a different pilot can block the relief valve, causing excessive system pressure.

Model Code

(F3) - C * - (H) ** - * (V) - (P) (*) D G (L) - (8) C - (H) - (*) - 20

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

CG - Relief valve, manifold or subplate mounted

3 Flow Type

H - High flow

4 Nominal Size

06 - ¾"
10 - 1¼"

5 Pressure Range PSI
(For heads #1 or #3)

B - 125 - 1000
C - 500 - 2000
F - 1500 - 3000
E - Vent

6 Vent Spring

V - High vent spring
Omitted - Low vent spring

7 Insta Plug Type

P - Insta Plug feature
Omitted - Not required

8 Plug Type

A - With plug only
B - With plug and receptacle
Omitted - Not required

9 Valve Type

D - Directional valve pilot stage

10 Mount Type

G - Manifold or subplate mounted

11 Solenoid Light Type

L - Solenoid indicator light
Omitted - Without lights

12 Spool Type

O - Open centered spool

13 Pilot Valve Type

N - No spring detent pilot stage
A - Offset pilot stage

14 Solenoid Type

H - Oil immersed solenoid
Omitted - Standard solenoid

15 Solenoid Voltage

Omitted - Standard solenoid 115 AC 60

16 Design

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP, OFR, and OFRS series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

Multi-Pressure Relief Valves

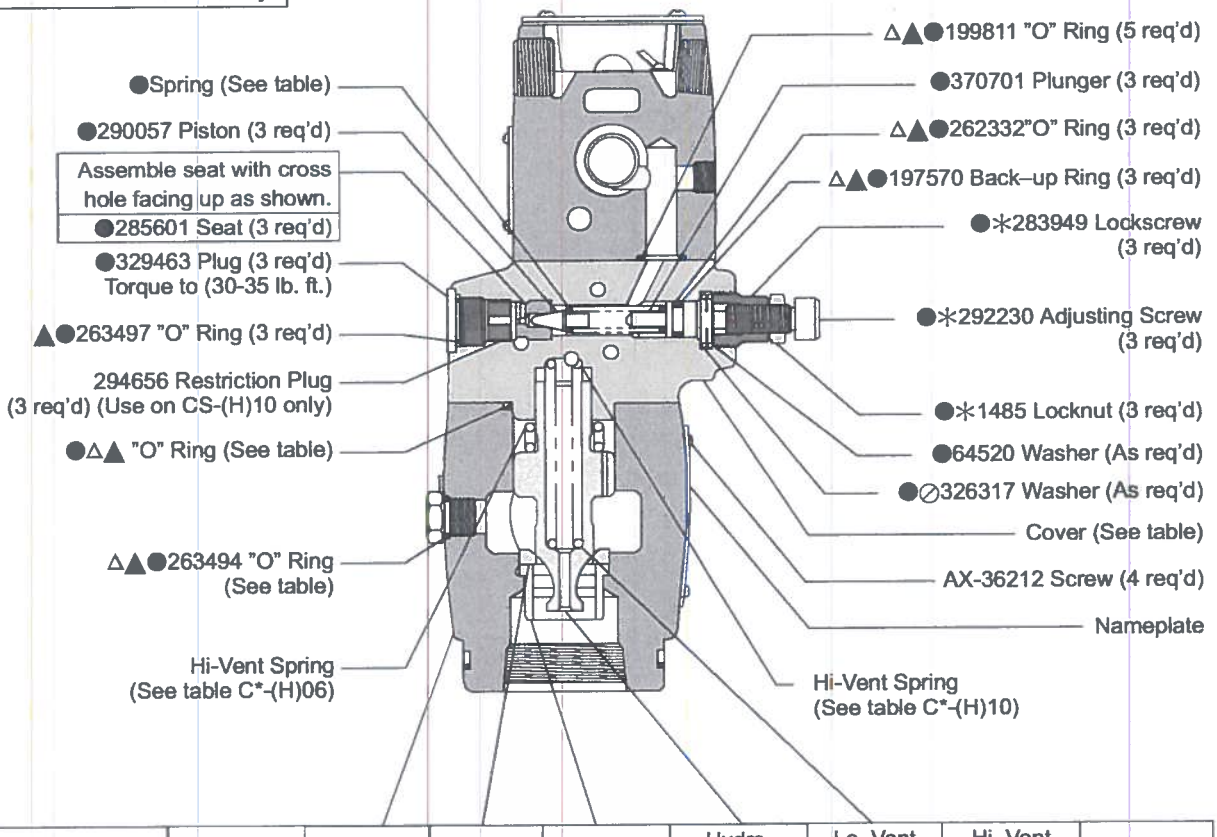
CS/CT-(H)-06-*(V)-(P)(*)DG(L)-(8)C-(H)-(*)-20
CS/CT-(H)-10-*(V)-(P)(*)DG(L)-(8)C-(H)-(*)-20

Revised 11/01/85

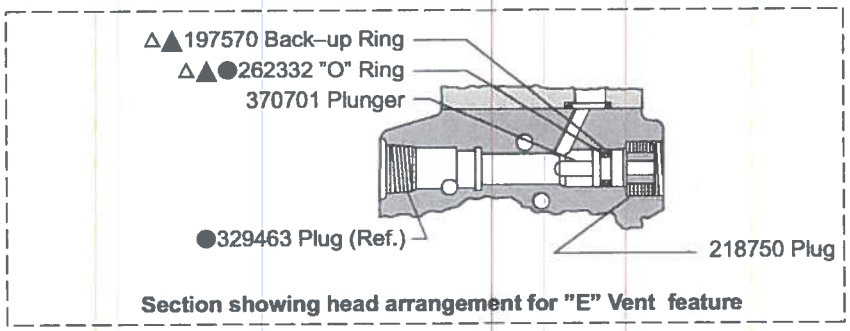
I-3686-S

Model	Head #1		Head #2		Head #3		●CT-(H)06 Cover S/A
	● Spring	Pressure Range PSI	● Spring	Pressure Range PSI	● Spring	Pressure Range PSI	
C*-(H)06/(H)10-CBF	583937	500 - 2000	2280	125 - 1000	2281	1500 - 3000	942198
C*-(H)06/(H)10-CEB			Vent	———	2280	125 - 1000	———
C*-(H)06/(H)10-CBC			2280	125 - 1000	583937	500 - 2000	942202
C*-(H)06/(H)10-FFB	2281	1500 - 3000	2281	1500 - 3000	2280	125 - 1000	942326

●Included in cover subassembly


●Spring (See table)
●290057 Piston (3 req'd)
Assemble seat with cross hole facing up as shown.
●285601 Seat (3 req'd)
●329463 Plug (3 req'd) Torque to (30-35 lb. ft.)
▲●263497 "O" Ring (3 req'd)
294656 Restriction Plug (3 req'd) (Use on CS-(H)10 only)
●Δ▲ "O" Ring (See table)
Δ▲●263494 "O" Ring (See table)
Hi-Vent Spring (See table C*-(H)06)
Δ▲●199811 "O" Ring (5 req'd)
●370701 Plunger (3 req'd)
Δ▲●262332"O" Ring (3 req'd)
Δ▲●197570 Back-up Ring (3 req'd)
●∗283949 Lockscrew (3 req'd)
●∗292230 Adjusting Screw (3 req'd)
●∗1485 Locknut (3 req'd)
●64520 Washer (As req'd)
●⊘326317 Washer (As req'd)
Cover (See table)
AX-36212 Screw (4 req'd)
Nameplate
Hi-Vent Spring (See table C*-(H)10)

Model	●"O" Ring	Body	Seat	Sleeve	Hydro Cone	Lo–Vent Spring	Hi–Vent Spring	Cover
CS-06	▲262361	581701	343153		343154	2077	184458	370664
CS-H06			589473	589472				
CS-10	Δ262367	580430	283954	———	283952	291822	291821	370669
CS-H10			587996	400730				
CT-06	▲262361	590348	343153	———	343154	2077	184458	370664
CT-H06			589473	589472				
CT–10	Δ262367	590300	283954	———	283952	291822	291821	370669
CTH–10			587996	400730				



Section showing head arrangement for "E" Vent feature

Use either a Lo-Vent or Hi-Vent spring as shown. Do not use both.

⊘This part used at final test to obtain correct pressure range.

∗Note
Coat 292330 Adjusting Screw, 283949 Lock Screw and 1485 Lock-nut with oil prior to assembly.

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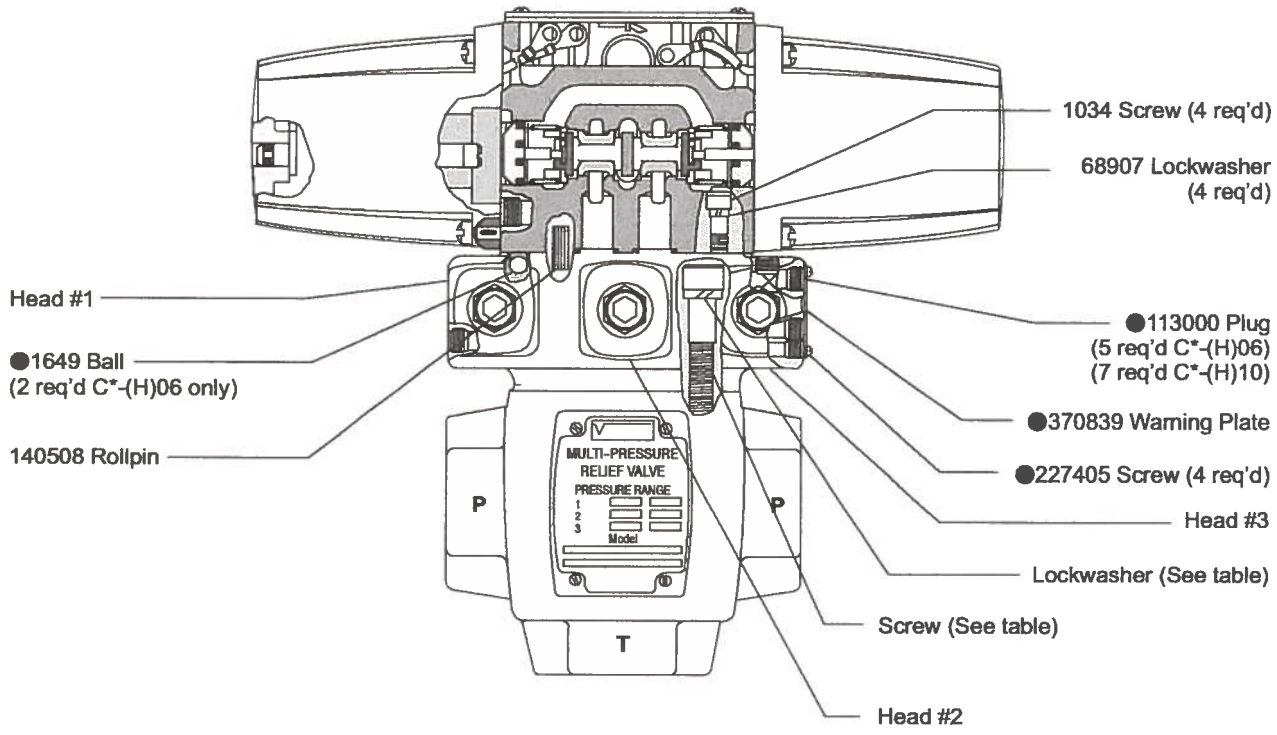
Insta–plug connectors for DG4S4 pilot stage are shown on drawing I–3487–S.

Oil immersed solenoid information is shown on drawing I-3498-S.

Warning

Do not use other than a DG4S4-018C-*-50 directional valve as the pilot for this relief valve. Use of a different pilot can block the relief valve causing excessive system pressure.

DG4S4-018C-*-50 Pilot Valve
(Refer to I-3477-S for parts information)



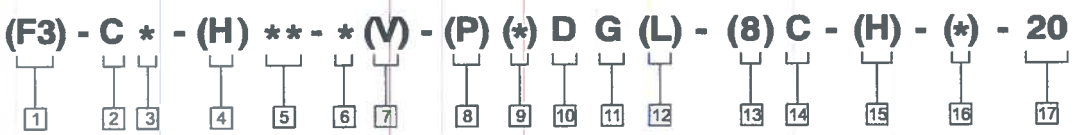
Model	Screw (4 req'd)	Lockwasher (4 req'd)
C*-(H)06	1036	68907
C*-(H)10	1076	68909

All seals, except directional valve interface seals, are F3. Use F3 seal kit to service all units.

▲Included in (F3)C*-(H)06 Seal Kit 919684

ΔIncluded in (F3)C*-(H)10 Seal Kit 919685

Model Code



1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

C - Relief valve

3 Connection

S - Straight thread
T - NPTF threaded

4 Flow Type

H - High flow

5 Nominal Size

06 - ¾"
10 - 1¼"

6 Pressure Range PSI
(For head #1, 2# & #3)

B - 125 - 1000 PSI
C - 500 - 2000 PSI
F - 1500 - 3000 PSI
E - Vent

7 Vent Spring

V - High vent spring
Omitted - Low vent spring

8 Insta Plug Type

P - Insta Plug
Omitted - Not required

9 Plug Type

A - With plug only
B - With plug and receptacle
Omitted - Not required

10 Valve Type

D - Directional valve pilot stage

11 Mount Type

G Manifold or subplate mounted

12 Solenoid Light Type

L - Solenoid indicator lights
Omitted - Without lights

13 Spool Type

8 - Tandem open center crossover spool

14 Pilot Valve Type

C - Spring centered pilot

15 Solenoid Type

H - Oil immersed solenoid
Omitted - Standard solenoid

16 Solenoid Voltage

Omitted - Standard solenoid 115 AC 60

17 Design

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP, OFR, and OFRS series are recommended.

Printed in U.S.A.

Vickers®

Service Data

Pumps

Multi-Pressure Relief Valves

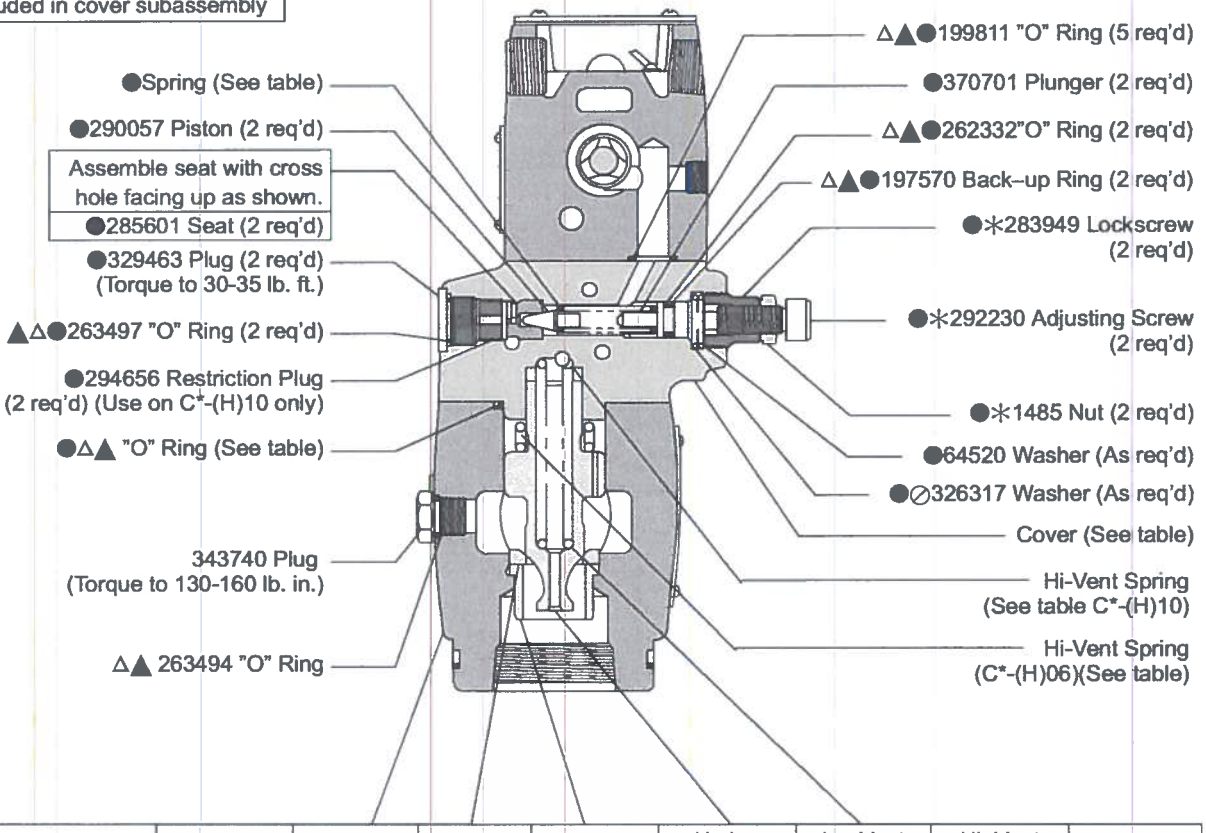
CS/CT-(H)-06-*(V)(P)(*)-DG(L)-0*-(H)-(*)-20
CS/CT-(H)-10-*(V)(P)(*)-DG(L)-0*-(H)-(*)-20

VICKERS
Revised 11/01/85

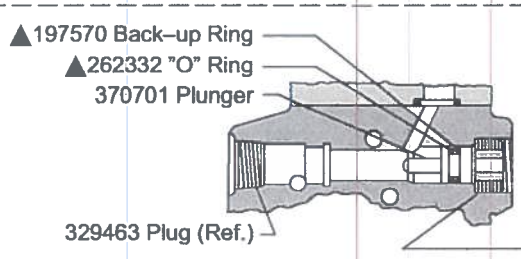
I-3687-S

Model	Head #1		Head #3		●CT-(H)06 Cover S/A	●CT-(H)10 Cover S/A
	● Spring	Pressure Range PSI	● Spring	Pressure Range PSI		
C*-(H)06/(H)10-BC	2280	125-1000	583937	500-2000	942155	942156
C*-(H)06/(H)10-BF			2281	1500-3000	———	———
C*-(H)06/(H)10-CF	583937	500–2000				

●Included in cover subassembly


●Spring (See table)
●290057 Piston (2 req'd)
Assemble seat with cross hole facing up as shown.
●285601 Seat (2 req'd)
●329463 Plug (2 req'd) (Torque to 30-35 lb. ft.)
▲Δ●263497 "O" Ring (2 req'd)
●294656 Restriction Plug (2 req'd) (Use on C*-(H)10 only)
●Δ▲ "O" Ring (See table)
343740 Plug (Torque to 130-160 lb. in.)
Δ▲ 263494 "O" Ring
Δ▲●199811 "O" Ring (5 req'd)
●370701 Plunger (2 req'd)
Δ▲●262332"O" Ring (2 req'd)
Δ▲●197570 Back–up Ring (2 req'd)
●∗283949 Lockscrew (2 req'd)
●∗292230 Adjusting Screw (2 req'd)
●∗1485 Nut (2 req'd)
●64520 Washer (As req'd)
●⊘326317 Washer (As req'd)
Cover (See table)
Hi-Vent Spring (See table C*-(H)10)
Hi-Vent Spring (C*-(H)06)(See table)

Model	●"O" Ring	Body	Seat	Sleeve	Hydro Cone	Lo–Vent Spring	Hi–Vent Spring	Cover
CS-06	▲262361	581701	343153	———	343154	2077	184458	370666
CS-H06			589473	589472				
CS-10	Δ262367	580430	283954	———	283952	291822	291821	370671
CS-H10			587996	400730				
CT-06	▲262361	590348	343153	———	343154	2077	184458	370666
CT-H06			589473	589472				
CT-10	Δ262367	590300	283954	———	283952	291822	291821	370671
CT-H10			587996	400730				



Section showing head arrangement for "E" Vent feature

Use either a Lo-Vent or Hi-Vent spring as shown. Do not use both.

⊘This part used at final test to obtain correct pressure range.

∗Note
Coat 292330 Adjusting Screw, 283949 Lock Screw and 1485 Lock-nut with oil prior to assembly.

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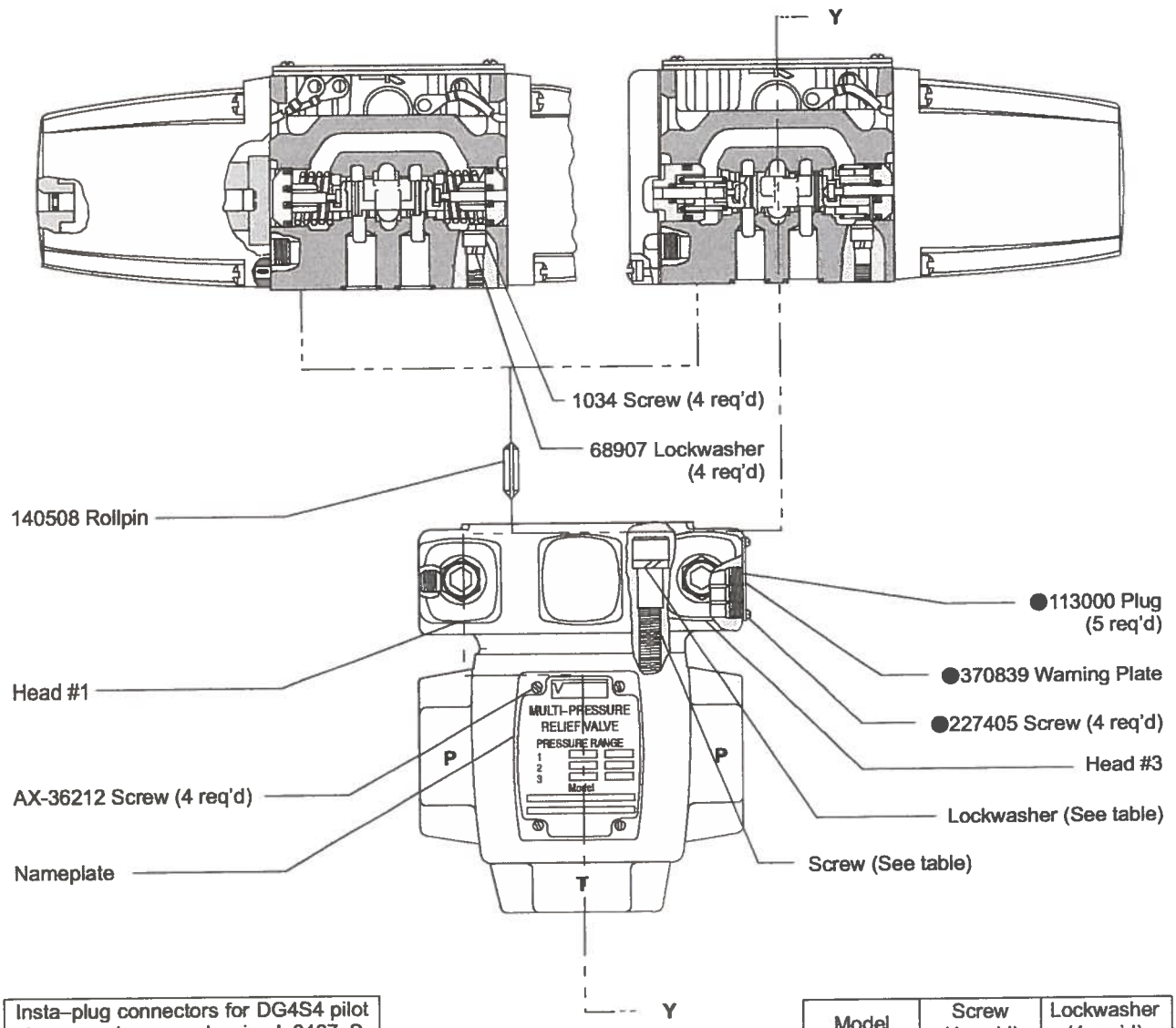
DG4S4-010N-*-51 Pilot Valve
(Refer to I-3471-S for parts information)

DG4S4-010A-*-50 Pilot Valve
(Refer to I-3478-S for parts information)



Insta–plug connectors for DG4S4 pilot stage are shown on drawing I–3487–S.

Model	Screw (4 req'd)	Lockwasher (4 req'd)
C*-(H)06	1036	68907
C*-(H)10	1076	68909

All seals, except directional valve interface seals, are F3. Use F3 seal kit to service all units.

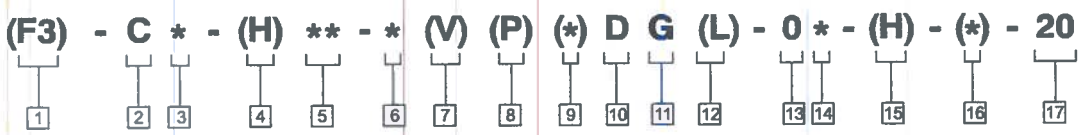
WARNNG
Do not use other than a DG4S4-010A-*-50 or a DG4S4-010N-*-51 directional valve as the pilot for this relief valve. Use of a different pilot can block the relief valve, causing excessive system pressure.

Oil immersed solenoid information is shown on drawing I-3498-S.

▲Included in (F3)C*-(H)06 Seal Kit 919684

ΔIncluded in (F3)C*-(H)10 Seal Kit 919685

Model Code



1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

C - Relief valve

3 Connection

S - Straight thread
T - NPTF threaded

4 Flow Type

H - High flow

5 Nominal Size

06 - ¾"
10 - 1¼"

6 Pressure Range PSI
(For head #1 or #3)

B - 125 - 1000
C - 500 - 2000
F - 1500 - 3000
E - Vent

7 Vent Spring

V - Hi-vent spring
Omitted - Lo-vent spring

8 Insta Plug Type

P - Insta Plug
Omitted - Not required

9 Plug Type

A - With plug only
B - With plug and receptacle
Omitted - Not required

10 Valve Type

D - Directional valve, pilot stage

11 Mount Type

G Manifold or subplate mounted

12 Solenoid Light Type

L - Solenoid indicator lights
Omitted - Without lights

13 Spool Type

O - Open centered spool

14 Pilot Valve Type

N - No–spring detent pilot stage
A - Offset pilot stage

15 Solenoid Type

H - Oil immersed solenoid
Omitted - Standard solenoid

16 Solenoid Voltage

Omitted - Standard solenoid 115 AC 60

17 Design

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP, OFR, and OFRS series are recommended.

Printed in U.S.A.

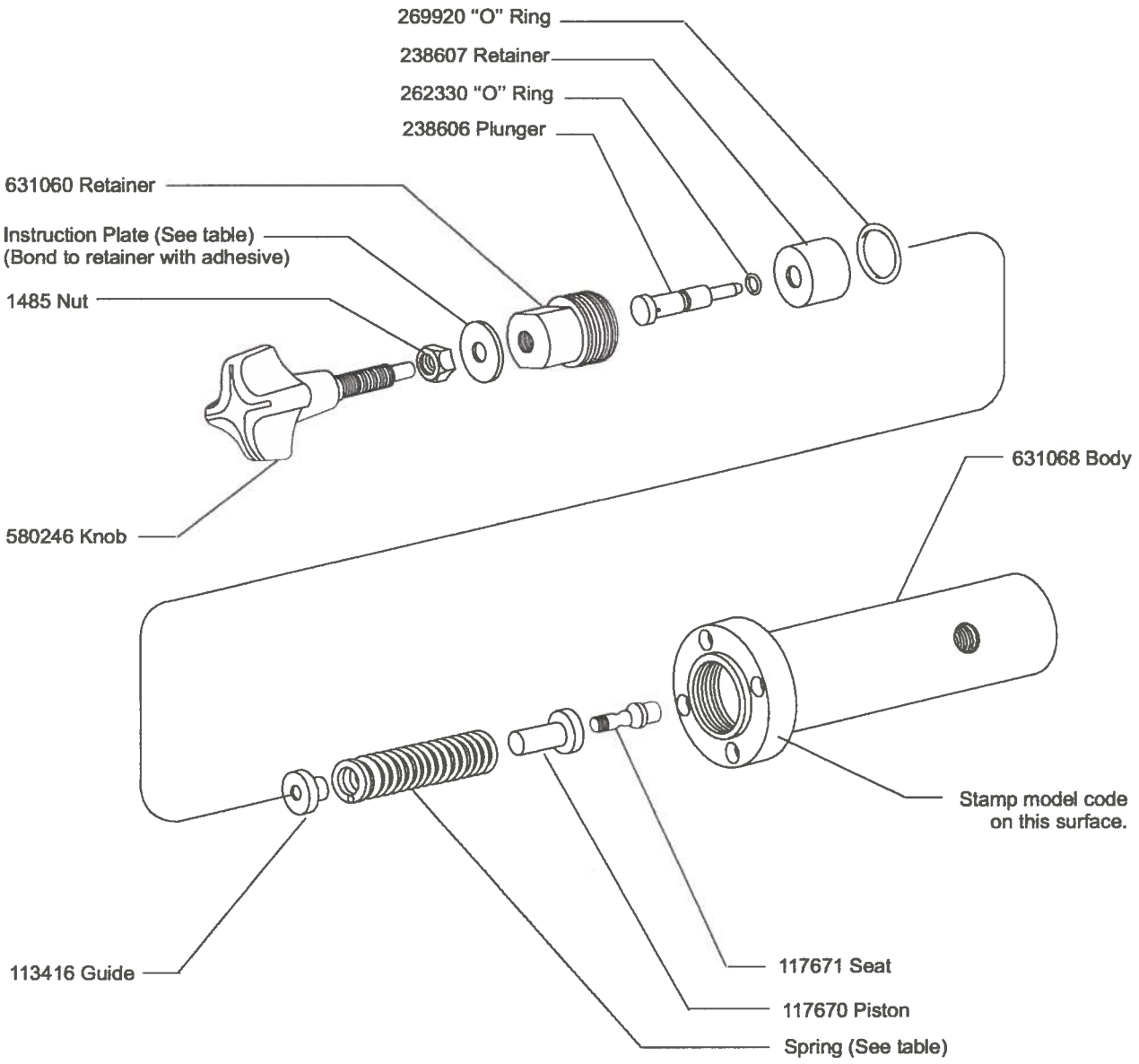
Service Data

Vickers®

Relief Valves

Remote Control Pressure Relief Valves

C-175-*-20



Model	Spring	Pressure Range	Instruction Plate
C-175-B-20	152609	75-1000	631057
C-175-C-20	152610	500-2000	631058
C-175-F-20	135007	1500-3000	631059

Model Code

C - 175 - * - 20

1 2 3 4

1 Model Series

C - Relief Valve

2 Series

175

3 Pressure Range

B - 75-1000
C - 500-2000
F - 1500-3000

4 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

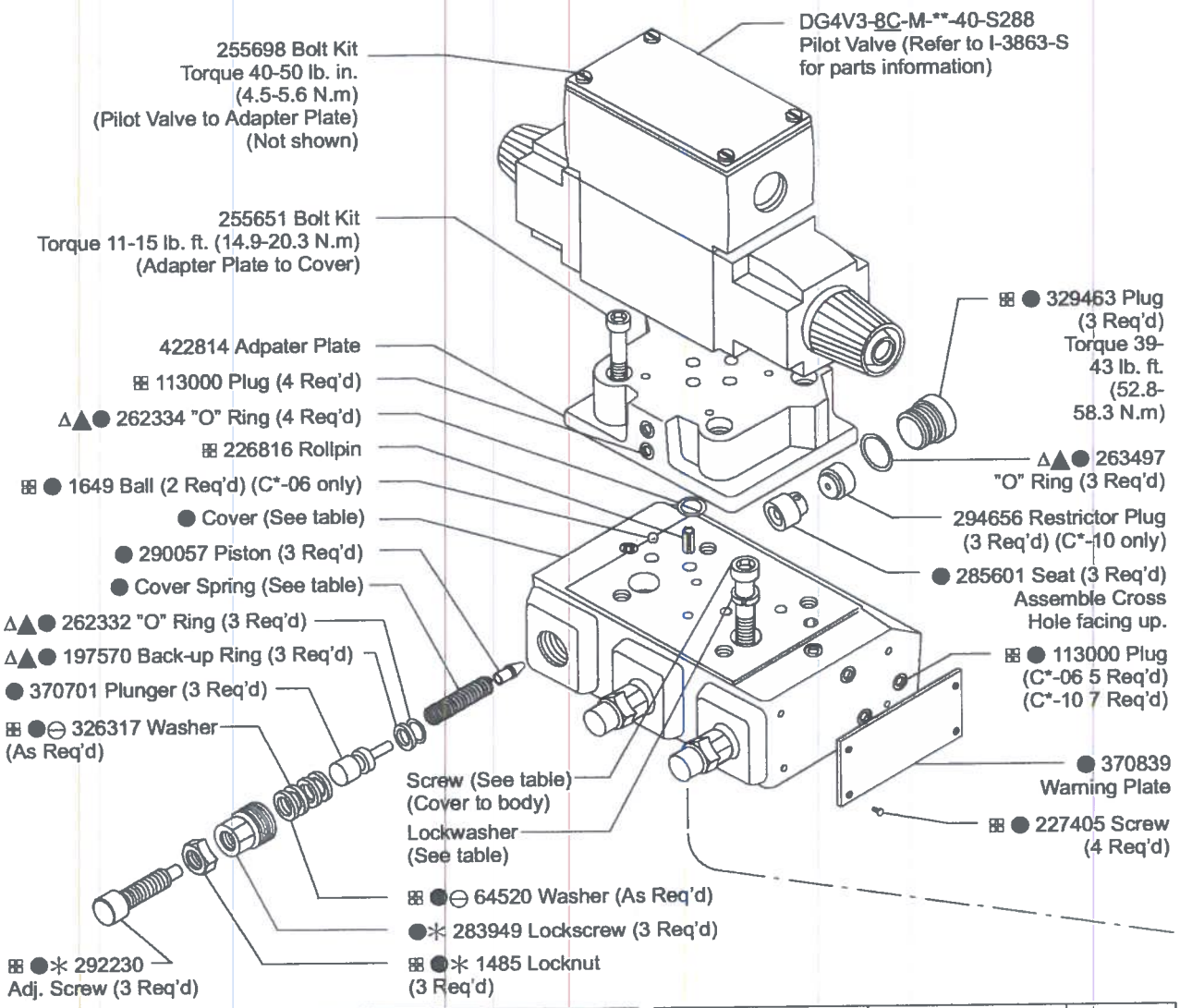
Multi-Pressure Relief Valve

CG/CS/CT-06-(*)-(V)-DG8C(P)(L)-M(***)-M-**-*-30**
CG/CS/CT-10-(*)-(V)-DG8C(P)(L)-M(***)-M-**-*-30**

VICKERS
Revised 8/01/86

I-3692-S

WARNNG
Use only a DG4V-3-8C-M-**-40-S288 directional valve as a pilot for this relief valve. Use of a different pilot can block relief valve, causing excessive system pressure.



Model	Cover Spring	Pressure Range PSI-(bar)
C*-***-B	2280	125-1000 (8.5-70)
C*-***-C	583937	500-2000 (35-140)
C*-***-F	2281	1500-3000 (105-210)

Cover Kits for C*-06-*** Are Available for Several Spring Arrangements.	
Spring Order in Head 1 2 3	● Included in Kit (-06 Only)
-CBF-	942198
-CBC-	942202
-FFB-	942326

Model	Screw (4 Req'd)	Torque		L'Washer 4 (Req'd)
		lb.ft.	N.m	
C*-06	1036	11-15	14.9-20.3	68907
C*-10	1076	35-43	47.5-58.3	68909

***Note**
Coat 292230 Adj. Screw, 283949 Lockscrew and 1485 Locknut with oil prior to assembly.

⊖This part used at final test to obtain correct pressure range.

Model	"O" Ring	Seat	Hydro Cone	Lo-Vent Spring	Hi-Vent Spring	Cover
C*-06	●▲262361	343153	343154	2077	184458	370664
C*-10	262367	283954	283952	291822	291821	370669
Note: Use either a Lo–Vent or Hi–Vent Spring. Do not use both. See Model Code.						

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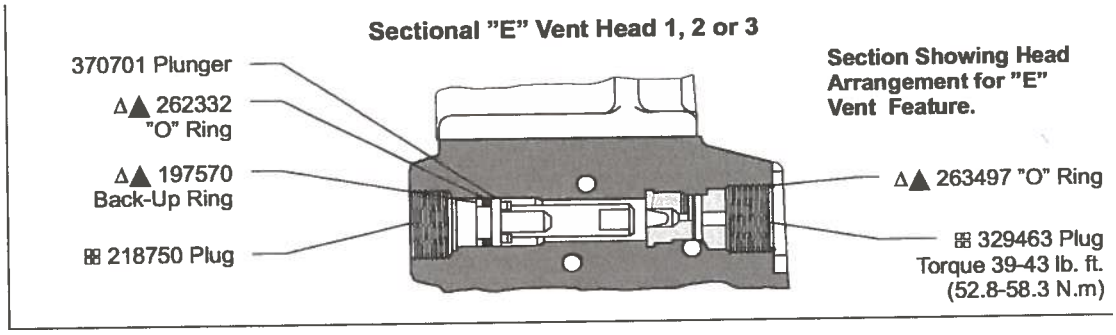
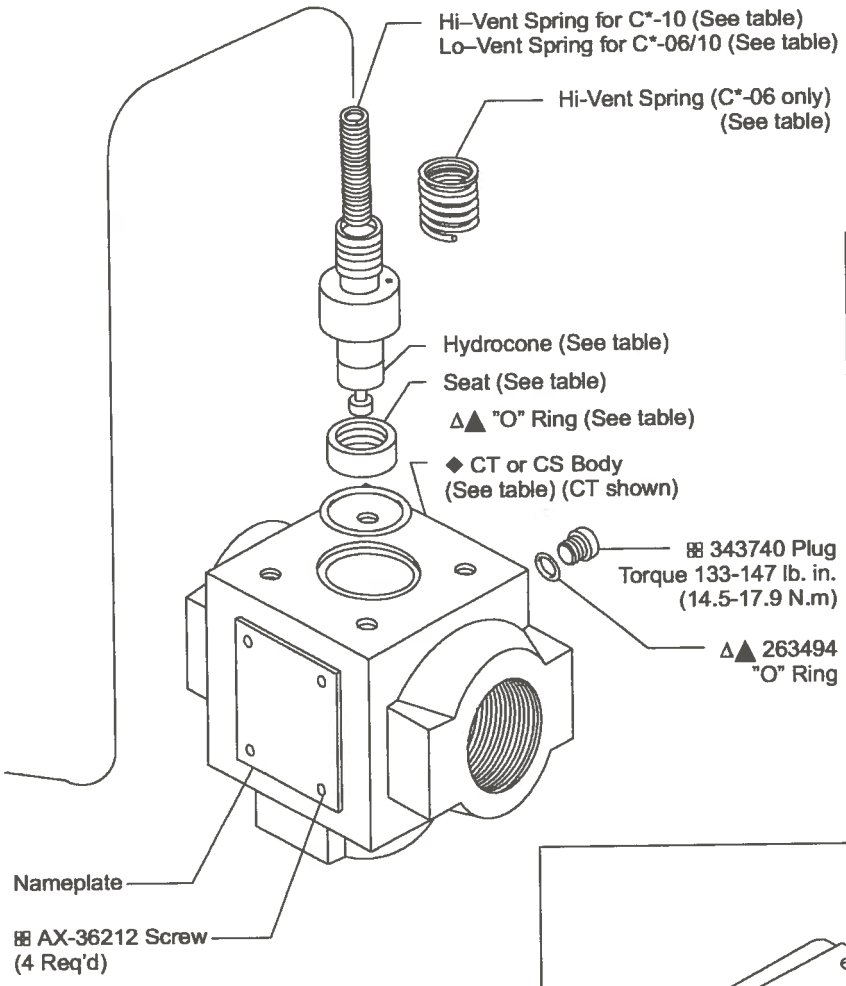
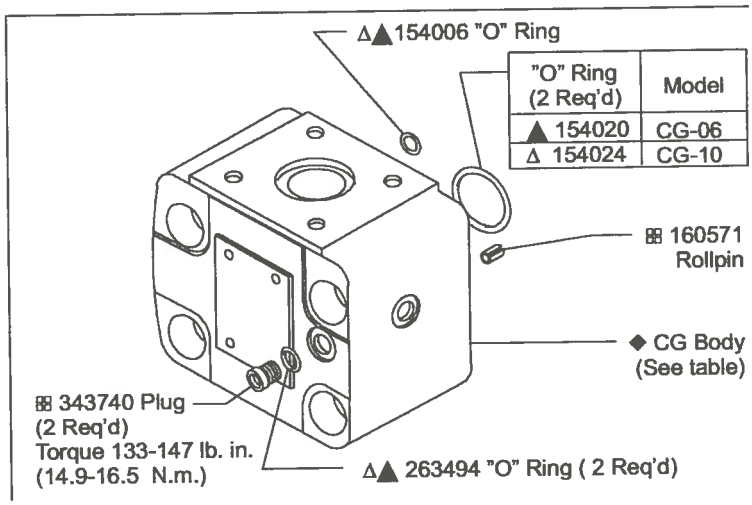
Sectional "E" Vent Head 1, 2 or 3


370701 Plunger
ΔA 262332 "O" Ring
ΔA 197570 Back-Up Ring
⊞ 218750 Plug
Section Showing Head Arrangement for "E" Vent Feature.
ΔA 263497 "O" Ring
⊞ 329463 Plug
Torque 39-43 lb. ft. (52.8-58.3 N.m)


Hi–Vent Spring for C*-10 (See table)
Lo–Vent Spring for C*-06/10 (See table)
Hi-Vent Spring (C*-06 only) (See table)
Hydrocone (See table)
Seat (See table)
ΔA "O" Ring (See table)
◆ CT or CS Body (See table) (CT shown)
⊞ 343740 Plug
Torque 133-147 lb. in. (14.5-17.9 N.m)
ΔA 263494 "O" Ring
Nameplate
⊞ AX-36212 Screw (4 Req'd)

Part	Kit	Part	Kit
1485	944064	226816	944071
1649	944067	227405	944074
AX-36212	944053	292230	944072
64520	944068	326317	944073
113000	944055	329463	944041
160571	944069	343740	944038
218750	944070		
Parts with ⊞ available only in kits of 25. Reference kit on parts order.			

Model	◆ Body	
	-06	-10
CG-	580456	581703
CS-	581701	580430
CT-	590348	590300

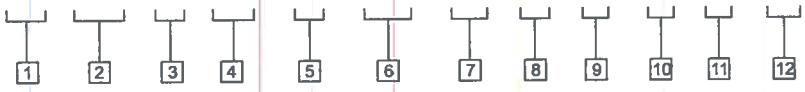


"O" Ring (2 Req'd)	Model
▲ 154020	CG-06
Δ 154024	CG-10

⊞ Available only in Kits of 25
▲ Included in F3-06 Seal Kit 919684
Δ Included in F3-10 Seal Kit 919685
◆ Not available for sale

Model Code

F3 - C * - ** - * - (V) - DG - 8C - M - M - W - B - 30**



1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

CGST - Relief valve, subplate, straight thread, NPTF thread

3 Nominal Size

06 - ¾"
10 - 1 ¼"

4 Pressure Range Head 1, 2 or 3

	PSI	Bar
B -	125-1000	(8, 5-70)
C -	500-2000	(35-140)
F -	1500-3000	(105-210)
E -	Vent	

5 Spring

V - Hi vent spring
Omitted - Lo vent spring

6 Directional Valve

7 Spool Type & Spring Arrangement

DG4V-3-8C-M(P**)-**-*-40-S288
(Refer to I-3863-S for detailed service information)

8 Flag Symbol Heading

Electrical features and options

9 DG4V-3 Pivot Valve & Adapter Plate

10 Wiring Housing

½" NPT thread

11 Coil Identification Letter

(Refer to I-3863-S)

12 Design

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP, OFR, and OFRS series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

Multi-Pressure Relief Valve

CG/CS/CT-06-(*)-(V)-DG0A(P)(L)-M(***)-M-**-*-30**
CG/CS/CT-10-(*)-(V)-DG0A(P)(L)-M(***)-M-**-*-30**

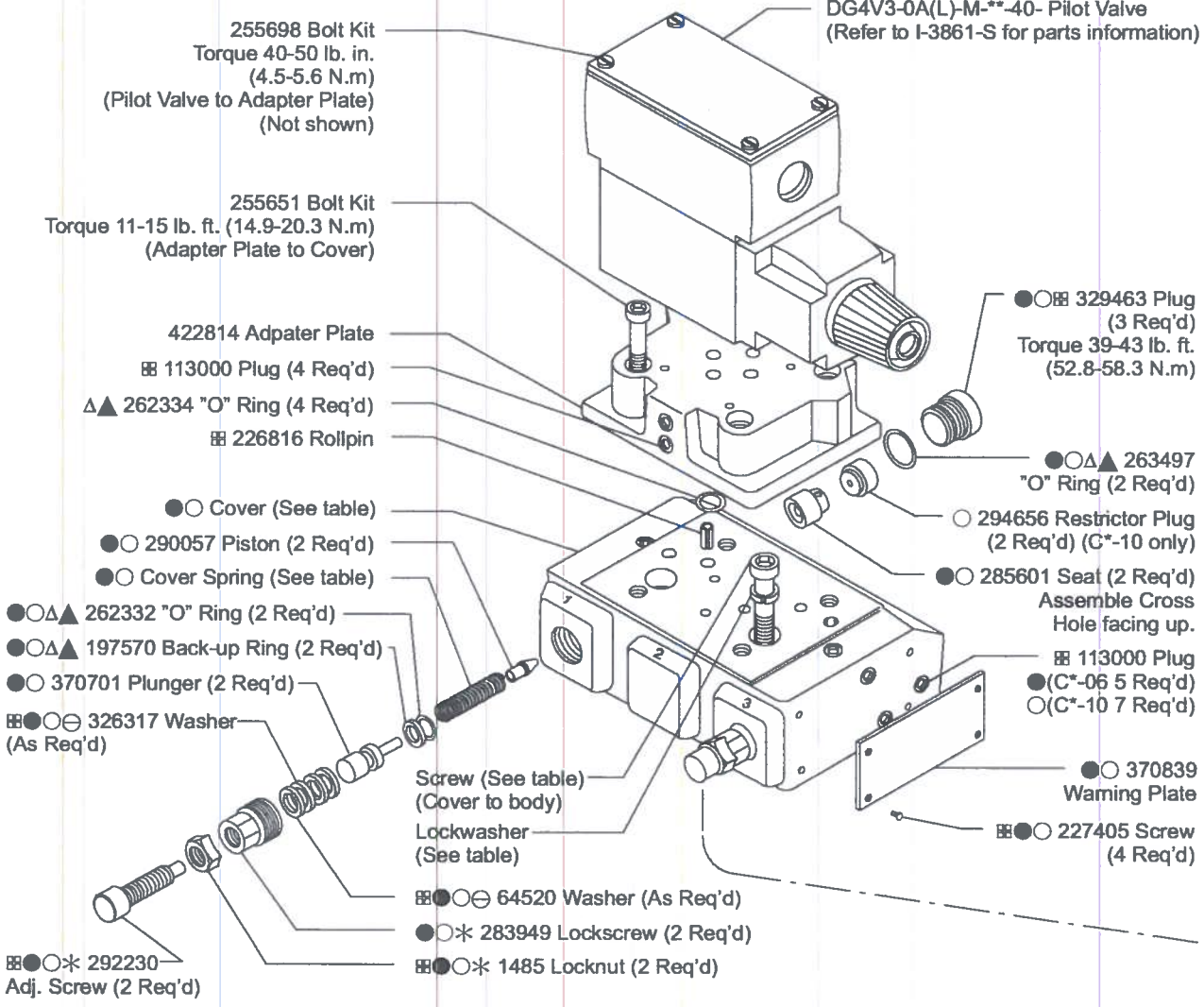
VICKERS

Revised 8/01/86

I-3693-S

C-10

WARNNG
Use only a DG4V-3-0A-M-**-40- or DG4V-3-0AL-M**-40 directional valve as a pilot for this relief valve. Use of a different pilot can block relief valve, causing excessive system pressure.



Model	Cover Spring	Pressure Range PSI-(bar)
C*-***-B	2280	125-1000 (8.5-70)
C*-***-C	583937	500-2000 (35-140)
C*-***-F	2281	1500-3000 (105-210)

Model	Screw (4 Req'd)	Torque		L'Washer 4 (Req'd)
		lb.ft.	N.m	
C*-06	1036	11-15	14.9-20.3	68907
C*-10	1076	35-43	47.5-58.3	68909

***Note**
Coat 292230 Adj. Screw, 283949 Lockscrew and 1485 Locknut with oil prior to assembly.

⊖This part used at final test to obtain correct pressure range.

Model	"O" Ring	Seat	Hydro Cone	Lo-Vent Spring	Hi-Vent Spring	Cover
C*-06	●▲262361	343153	343154	2077	184458	370666
C*-10	262367	283954	283952	291822	291821	370671
Note: Use either a Lo–Vent or Hi–Vent Spring. Do not use both. See Model Code.						

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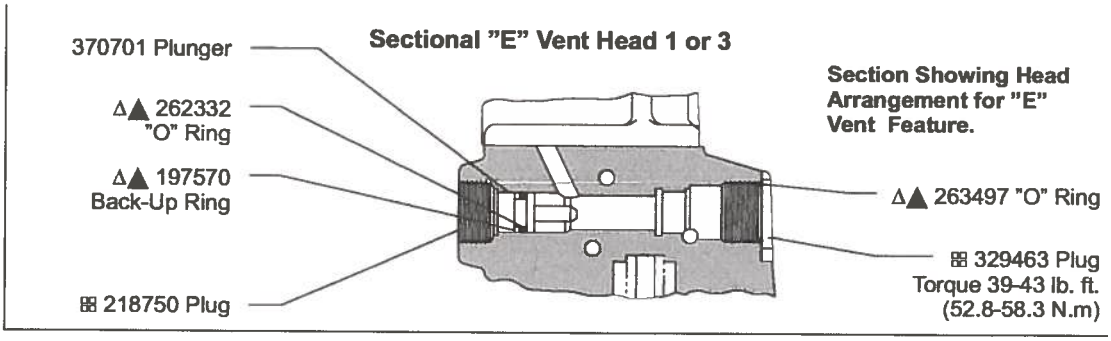
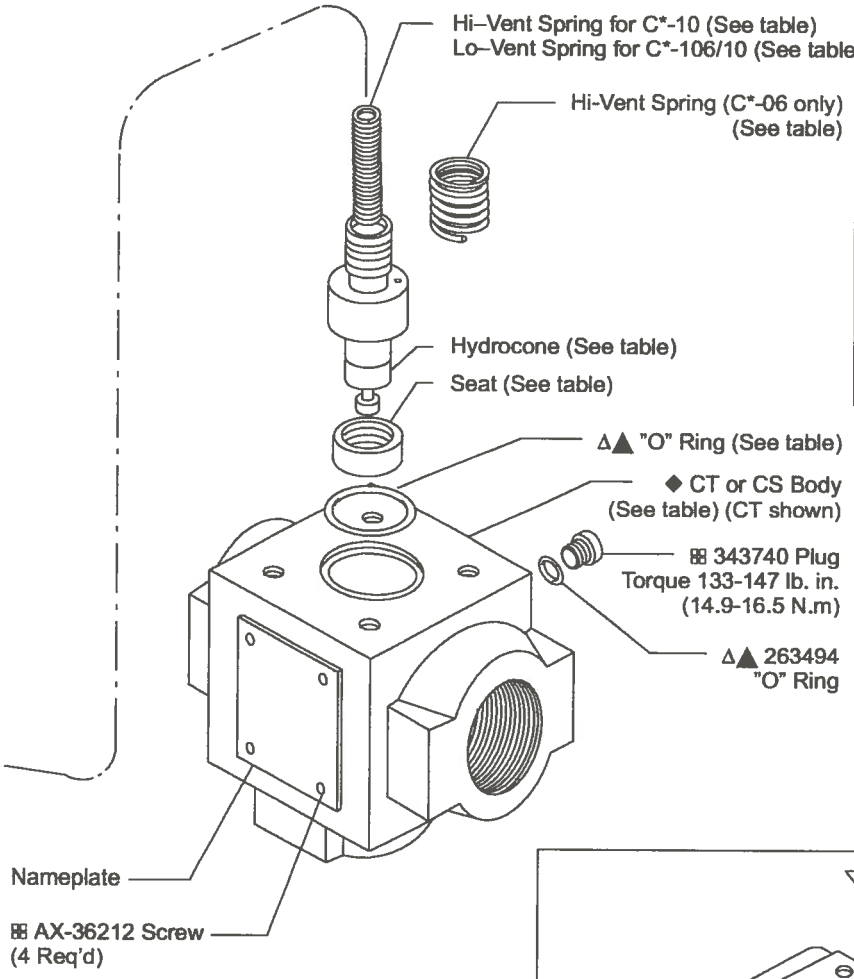
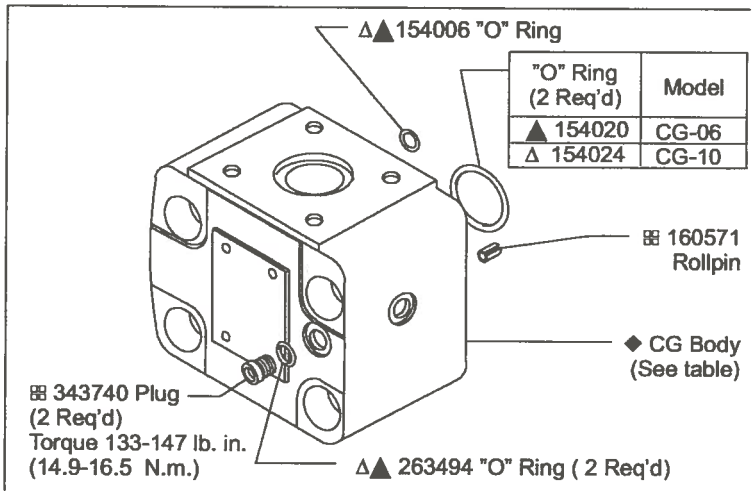

370701 Plunger
Δ▲ 262332 "O" Ring
Δ▲ 197570 Back-Up Ring
⊞ 218750 Plug
Sectional "E" Vent Head 1 or 3
Section Showing Head Arrangement for "E" Vent Feature.
Δ▲ 263497 "O" Ring
⊞ 329463 Plug Torque 39-43 lb. ft. (52.8-58.3 N.m)


Hi–Vent Spring for C*-10 (See table)
Lo–Vent Spring for C*-106/10 (See table)
Hi-Vent Spring (C*-06 only) (See table)
Hydrocone (See table)
Seat (See table)
Δ▲ "O" Ring (See table)
◆ CT or CS Body (See table) (CT shown)
⊞ 343740 Plug Torque 133-147 lb. in. (14.9-16.5 N.m)
Δ▲ 263494 "O" Ring
Nameplate
⊞ AX-36212 Screw (4 Req'd)

Part	Kit	Part	Kit
1485	944064	226816	944071
AX-36212	944053	227405	944074
64520	944068	292230	944072
113000	944055	326317	944073
160571	944069	329463	944041
218750	944070	343740	944038
Parts with ⊞ available only in kits of 25. Reference kit on parts order.			

Model	◆ Body	
	-06	-10
CG-	580456	581703
CS-	581701	580430
CT-	590348	590300


Δ▲154006 "O" Ring
"O" Ring (2 Req'd) Model
▲ 154020 CG-06
Δ 154024 CG-10
⊞ 160571 Rollpin
◆ CG Body (See table)
⊞ 343740 Plug (2 Req'd) Torque 133-147 lb. in. (14.9-16.5 N.m.)
Δ▲ 263494 "O" Ring (2 Req'd)

⊞ Available only in Kits of 25
▲ Included in F3-06 Seal Kit 919684
Δ Included in F3-10 Seal Kit 919685
● Included in CT-06-BC Cover Kit 942155
○ Included in CT-10-BC Cover Kit 942156
◆ Not available for sale

Model Code

F3 - C * - ** - ** - (V) - DG - 0A - M - M - W - B - 30

1 2 3 4 5 6 7 8 9 10 11 12

1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

CGST - Relief valve, subplate, straight thread, NPTF thread

3 Nominal Size

06 - ¾"
10 - 1 ¼"

4 Pressure Range Head 1, 2 or 3

	PSI	Bar
B -	125-1000	(8, 5-70)
C -	500-2000	(35-140)
F -	1500-3000	(105-210)
E -	Vent	

5 Spring

V - Hi vent spring
Omitted - Lo vent spring

6 Directional Valve

7 Spool Type & Spring Arrangement

DG4V-3-0A(L)-M-**-*-40
(Refer to I-3861-S for detailed service information)

8 Flag Symbol Heading

Electrical features and options

9 DG4V-3 Pivot Valve & Adapter Plate

10 Wiring Housing

½" NPT thread

11 Coil Identification Letter

(Refer to I-3861-S)

12 Design

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP, OFR, and OFRS series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

Multi-Pressure Relief Valve

CG/CS/CT-06-(*)-(V)-DG8BL-M(***)-M-**-*-30**
CG/CS/CT-10-(*)-(V)-DG8BL-M(***)-M-**-*-30**

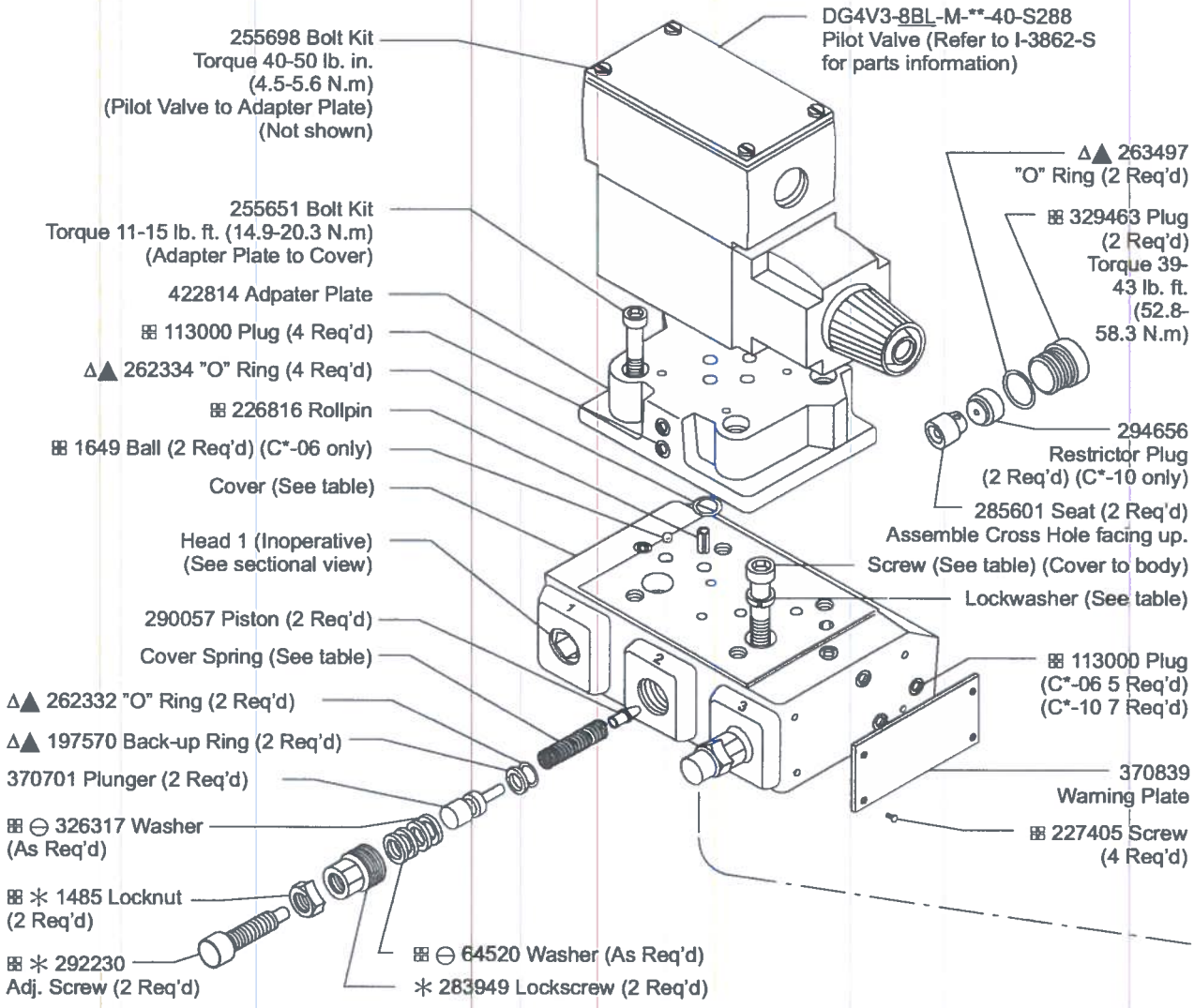
VICKERS

Revised 8/01/86

I-3694-S

C-10

WARNNG
Use only a DG4V-3-8BL-M-**-40-S288 directional valve as a pilot for this relief valve. Use of a different pilot can block relief valve, causing excessive system pressure.



Model	Cover Spring	Pressure Range PSI-(bar)
C*-***-B	2280	125-1000 (8.5-70)
C*-***-C	583937	500-2000 (35-140)
C*-***-F	2281	1500-3000 (105-210)

Model	Screw (4 Req'd)	Torque		L'Washer 4 (Req'd)
		lb.ft.	N.m	
C*-06	1036	11-15	14.9-20.3	68907
C*-10	1076	35-43	47.5-58.3	68909

***Note**
Coat 292230 Adj. Screw, 283949 Lockscrew and 1485 Locknut with oil prior to assembly.

⊖This part used at final test to obtain correct pressure range.

Model	"O" Ring	Seat	Hydro Cone	Lo-Vent Spring	Hi-Vent Spring	Cover
C*-06	●▲262361	343153	343154	2077	184458	370664
C*-10	262367	283954	283952	291822	291821	370669
Note: Use either a Lo–Vent or Hi–Vent Spring. Do not use both. See Model Code.						

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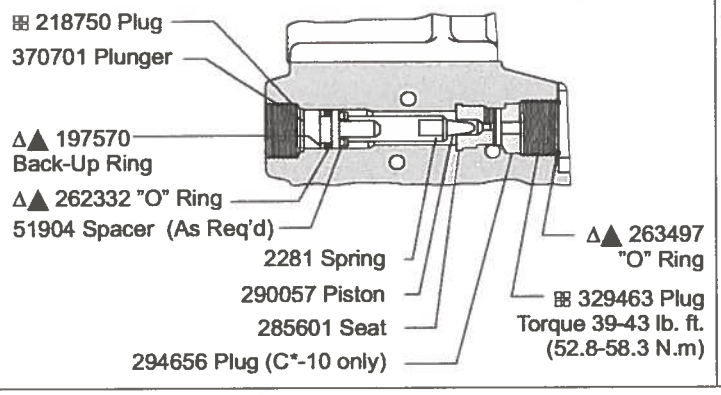
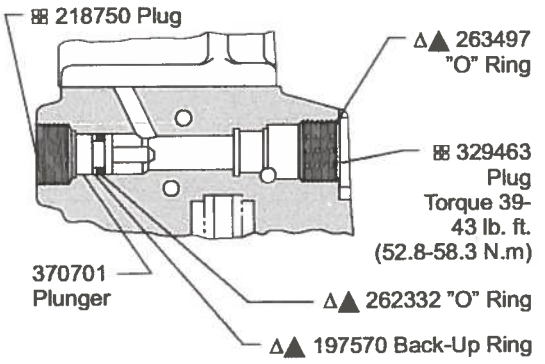
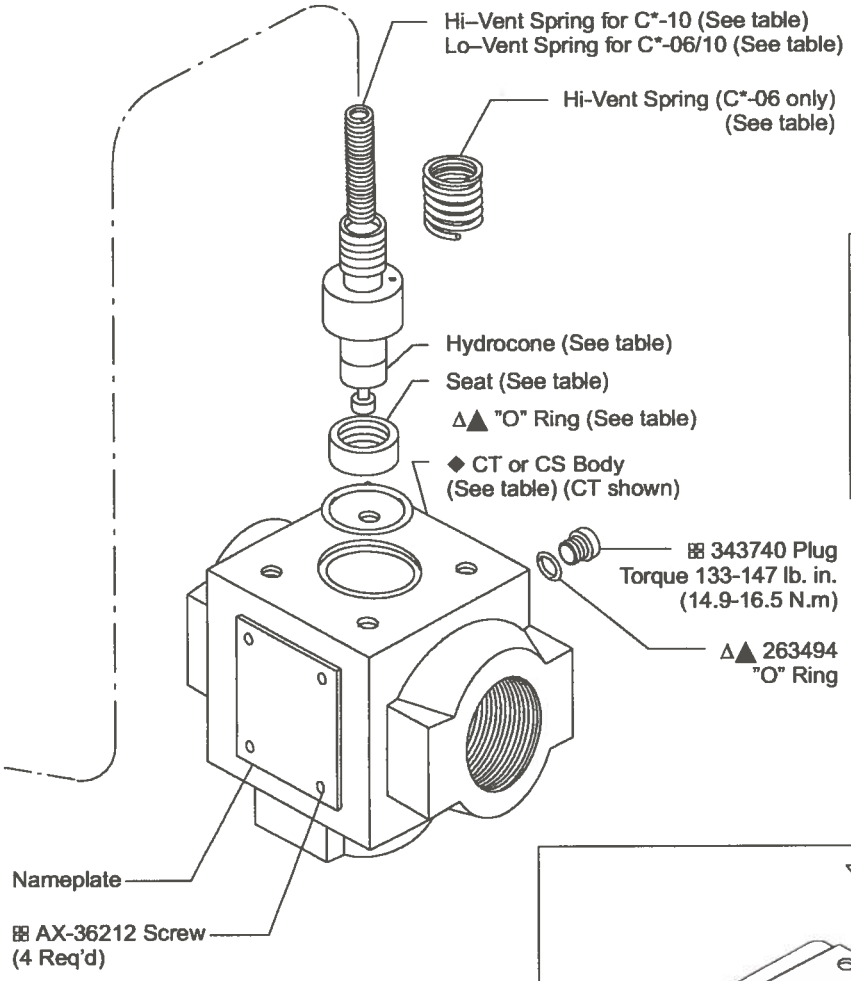
Sectional Head 1 Inoperative



Section "E" Vent Head 2 or 3

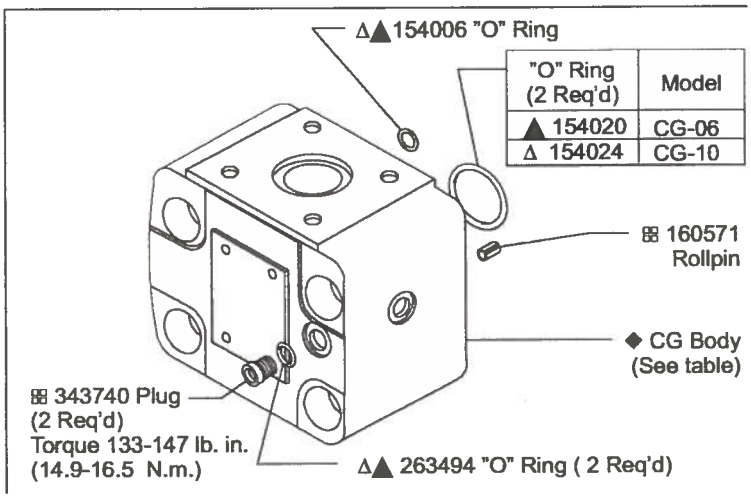



Hi–Vent Spring for C*-10 (See table)
Lo–Vent Spring for C*-06/10 (See table)
Hi-Vent Spring (C*-06 only) (See table)
Hydrocone (See table)
Seat (See table)
ΔA "O" Ring (See table)
◆ CT or CS Body (See table) (CT shown)
⊞ 343740 Plug Torque 133-147 lb. in. (14.9-16.5 N.m)
ΔA 263494 "O" Ring
Nameplate
⊞ AX-36212 Screw (4 Req'd)

Part	Kit	Part	Kit
1485	944064	226816	944071
1649	944067	227405	944074
AX-36212	944053	292230	944072
64520	944068	326317	944073
113000	944055	329463	944041
160571	944069	343740	944038
218750	944070		

Parts with ⊞ available only in kits of 25. Reference kit on parts order.

Model	◆ Body	
	-06	-10
CG-	580456	581703
CS-	581701	580430
CT-	590348	590300



"O" Ring (2 Req'd)	Model
A 154020	CG-06
Δ 154024	CG-10

⊞ Available only in Kits of 25
A Included in F3-06 Seal Kit 919684
Δ Included in F3-10 Seal Kit 919685
◆ Not available for sale

Model Code

F3 - C * - ** - ** - (V) - DG - 8BL - M - M - W - B - 30

1 2 3 4 5 6 7 8 9 10 11 12

1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

CGST - Relief valve, subplate, straight thread, NPTF thread

3 Nominal Size

06 - ¾"
10 - 1 ¼"

4 Pressure Range Head 1, 2 or 3

	PSI	Bar
B -	125-1000	(8, 5-70)
C -	500-2000	(35-140)
F -	1500-3000	(105-210)
E -	Vent	

5 Spring

V - Hi vent spring
Omitted - Lo vent spring

6 Directional Valve

7 Spool Type & Spring Arrangement

DG4V-3-8BL-M(P**)-**-*-40
(Refer to I-3863-S for detailed service information)

8 Flag Symbol Heading

Electrical features and options

9 DG4V-3 Pivot Valve & Adapter Plate

10 Wiring Housing

½" NPT thread

11 Coil Identification Letter

(Refer to I-3862-S)

12 Design

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP, OFR, and OFRS series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Pressure Control

EATON

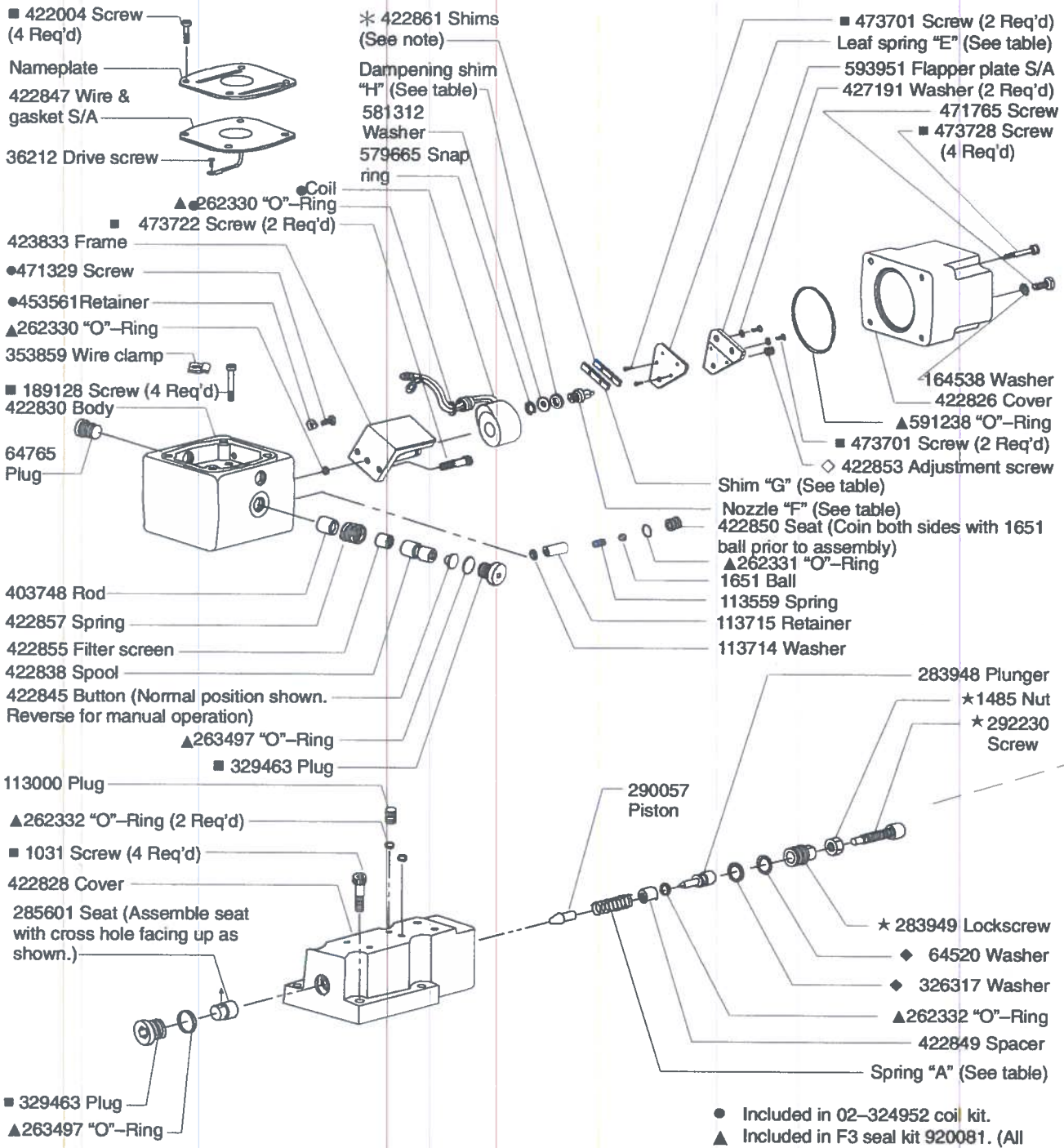
Remote Electrically Modulated Relief Valves

CGE–06–1–22
CGE–06–3(V)–22–(S6)(S7)

VICKERS

Revised 06–01–99

I–3695–S



■ Screw	■ Plug	Torque (N.m.)	Torque (lb. in.)	Torque (lb. ft.)
1031		12.6 Max.	112 Max.	
189128		4.7 Max	42 Max	
	329463	40.7 – 47.5	360 – 420	30 – 35
	343740	14.7 – 18.1	130 – 160	
422004		0.7 – 0.9	6 –8	
473701		1.4 – 1.6	12 – 14	
473722		4.0 – 4.5	35 – 40	
473728		4.0 – 4.5	35 – 40	

- ● Included in 02–324952 coil kit.
- ▲ Included in F3 seal kit 920081. (All seals, except interface, are F3. Use the F3 seal kit to service all units.)
- □ At assembly, adjust screw until dimension between screw and nozzle is .004 – .005 in. or 0.10 – 0.13 mm.
- ■ Included in Screw/Plug/Nozzle Torque tables.
- ✳ Number of shims are factory selected to obtain maximum pressure setting.
- ◇ Not available for sale
- ★ Coat with oil prior to assembly
- ◆ Arrange for correct pressure adjustment range

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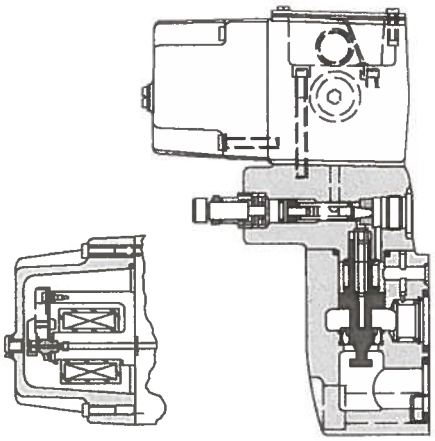
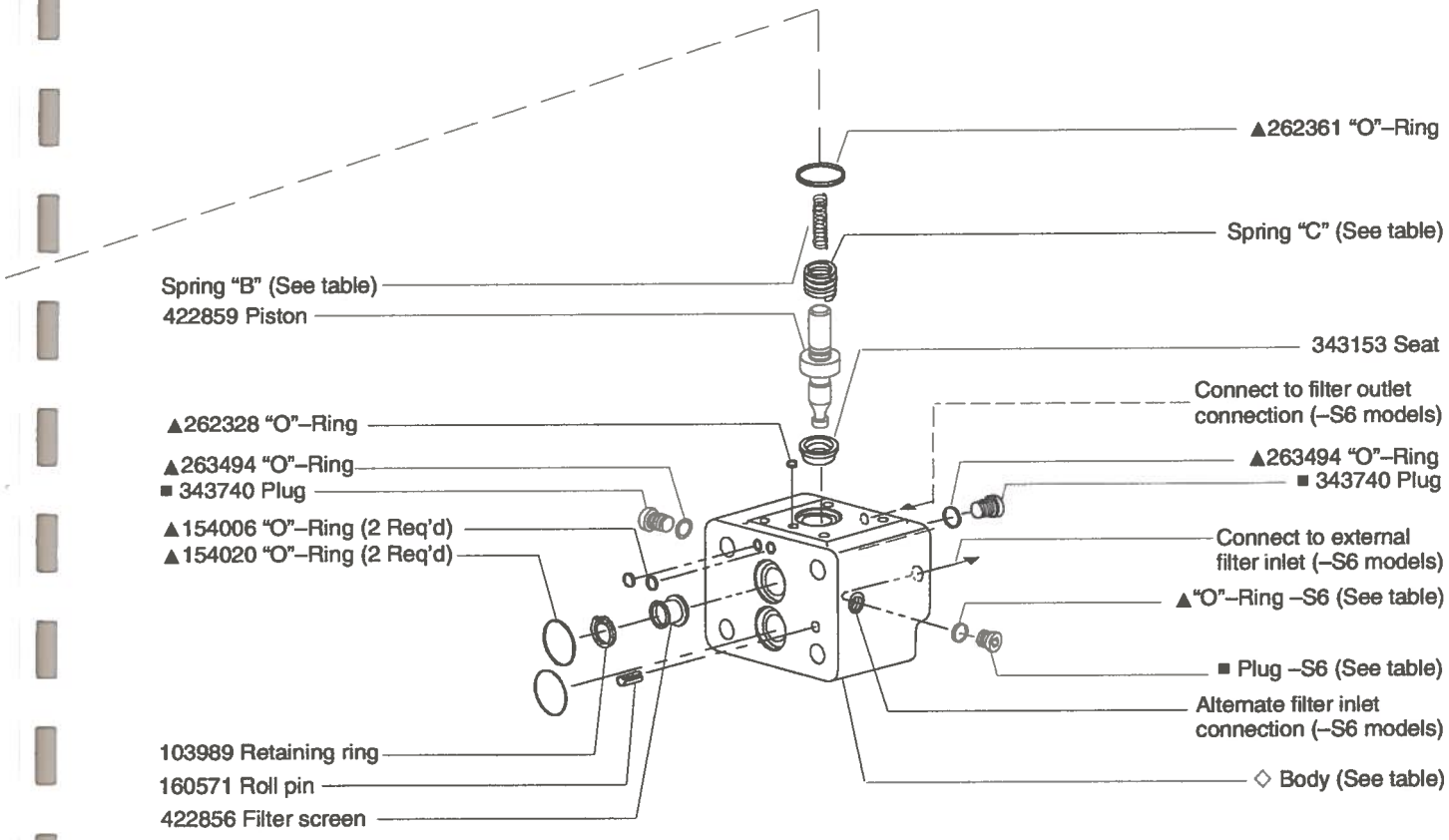
45° Cross sectional view of nozzle, flapper and coil.



■ Nozzle "F"	Torque (lb. in.)	Torque (N.m.)
424189	11–13	1.2–1.5
422842	13–15	1.5–1.7

Model	Pressure range	Spring "A"	Spring "B"	Spring "C"	Leaf spring "E"	■ Nozzle "F"	Shim "G"	Damping shim "H"
CGE–06–1–22	75–1000 psi	2280	2077	——	424188	424189	424190	424724
CGE–06–3–22	150–3000 psi	2281	2077	——	422835	422842	422839	——
CGE–06–3V–22	300–3000 psi	2281	——	184458	422835	422842	422839	——



Model	◇ Body	▲ "O"–Ring	▲ Plug	External 3000 PSI 35 micron filter Req'd
CGE–06–**–22	597718			No
CGE–06–**–22–S6	597831	263494	343740	Yes

Service Data

Vickers®

Valves

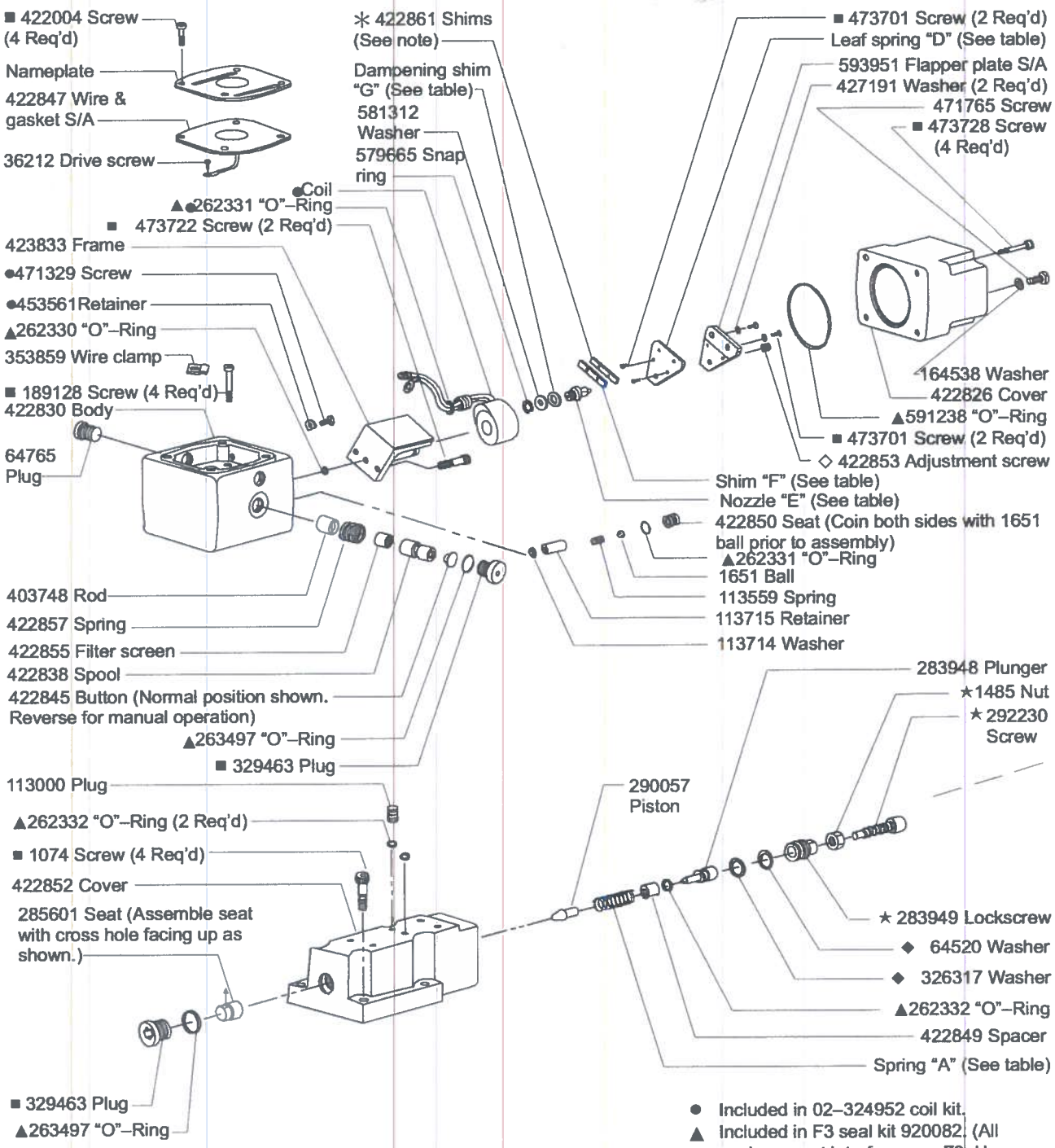
Remote Electrically Modulated Relief Valves

CGE–10–1–22
CGE–10–3(V)–22–(S6)

VICKERS

Revised 06–01–99

I–3696–S



■ Screw	■ Plug	Torque (N.m.)	Torque (lb. in.)	Torque (lb. ft.)
1074	———	36.0 Max.	318 Max.	26.5
189128		4.7 Max	42 Max	———
———	329463	40.7 – 47.5	360 – 420	30 – 35
	343740	14.7 – 18.1	130 – 160	
422004	———	0.7 – 0.9	6 –8	———
473701		1.4 – 1.6	12 – 14	
473722		4.0 – 4.5	35 – 40	
473728		4.0 – 4.5	35 – 40	

- ● Included in 02–324952 coil kit.
- ▲ Included in F3 seal kit 920082. (All seals, except interface, are F3. Use the F3 seal kit to service all units.)
- □ At assembly, adjust screw until dimension between screw and nozzle is .004 – .005 in. or 0.10 – 0.13 mm.
- ■ Included in Screw/Plug/Nozzle Torque tables.
- ✳ Number of shims are factory selected to obtain maximum pressure setting.
- ◇ Not available for sale
- ★ Coat with oil prior to assembly
- ◆ Arrange for correct pressure adjustment range

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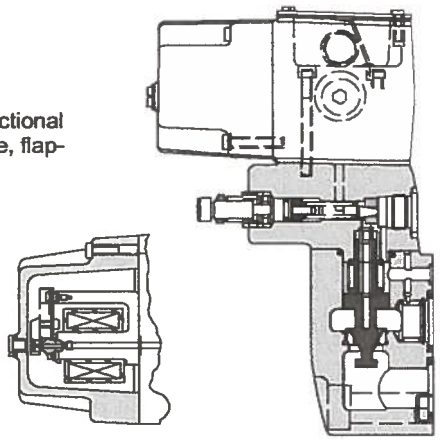
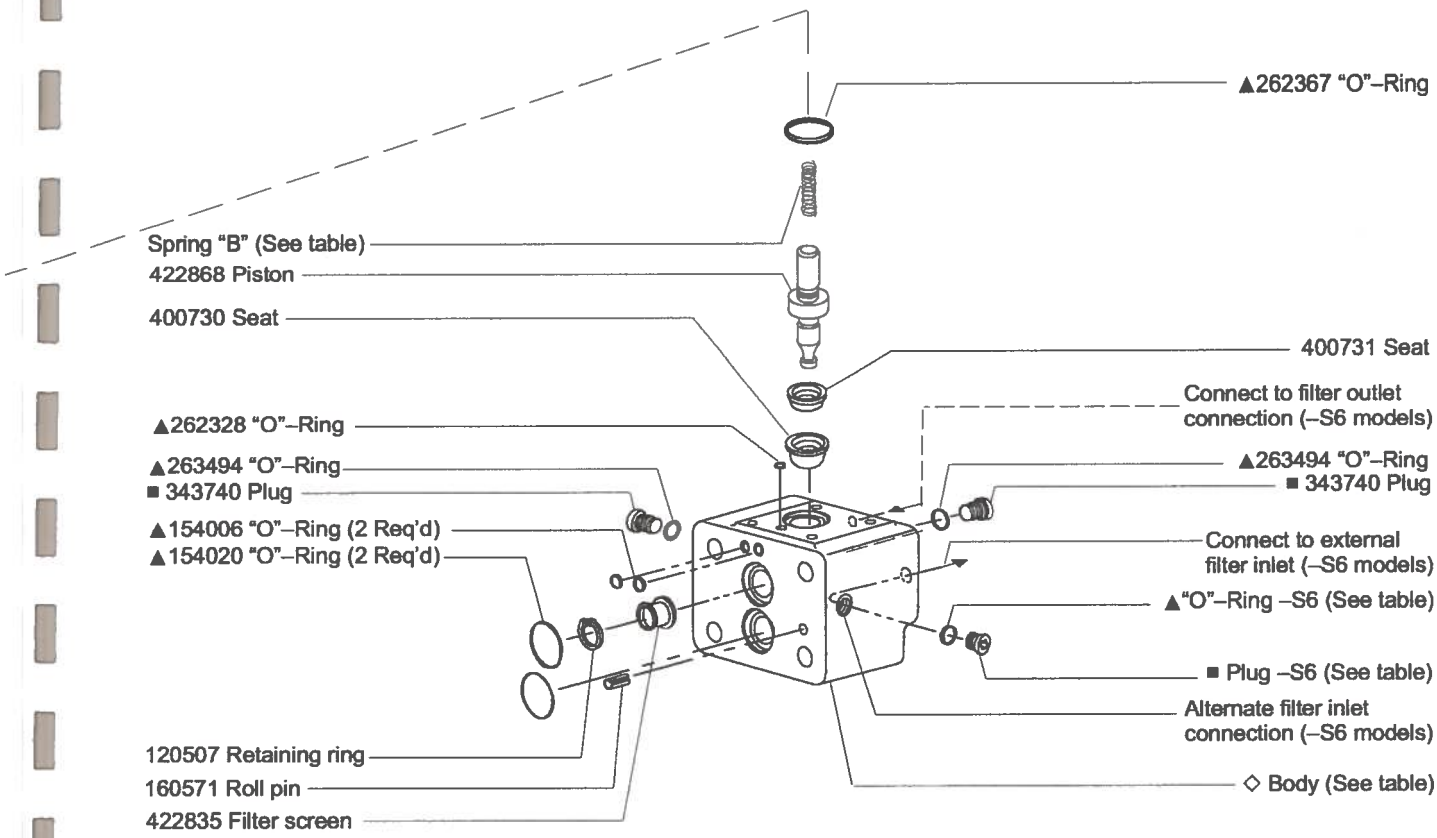
45° Cross sectional view of nozzle, flapper and coil.



■ Nozzle "E"	Torque (lb. in.)	Torque (N.m.)
424189	11–13	1.2–1.5
422842	13–15	1.5–1.7

Model	Pressure range	Spring "A"	Spring "B"	Leaf spring "D"	■ Nozzle "E"	Shim "F"	Damping shim "G"
CGE–10–1–22	75–1000 psi	2280	424202	424188	424189	424190	424724
CGE–10–3–22	150–3000 psi	2281	424731	422835	422842	422839	——
CGE–10–3V–22	300–3000 psi	2281	291821	422835	422842	422839	——



Model	◇ Body	▲ "O"–Ring	▲ Plug	External 3000 PSI 35 micron filter Req'd
CGE–10–**–22	597719			No
CGE–10–**–22–S6	597832	263494	343740	Yes

Service Data

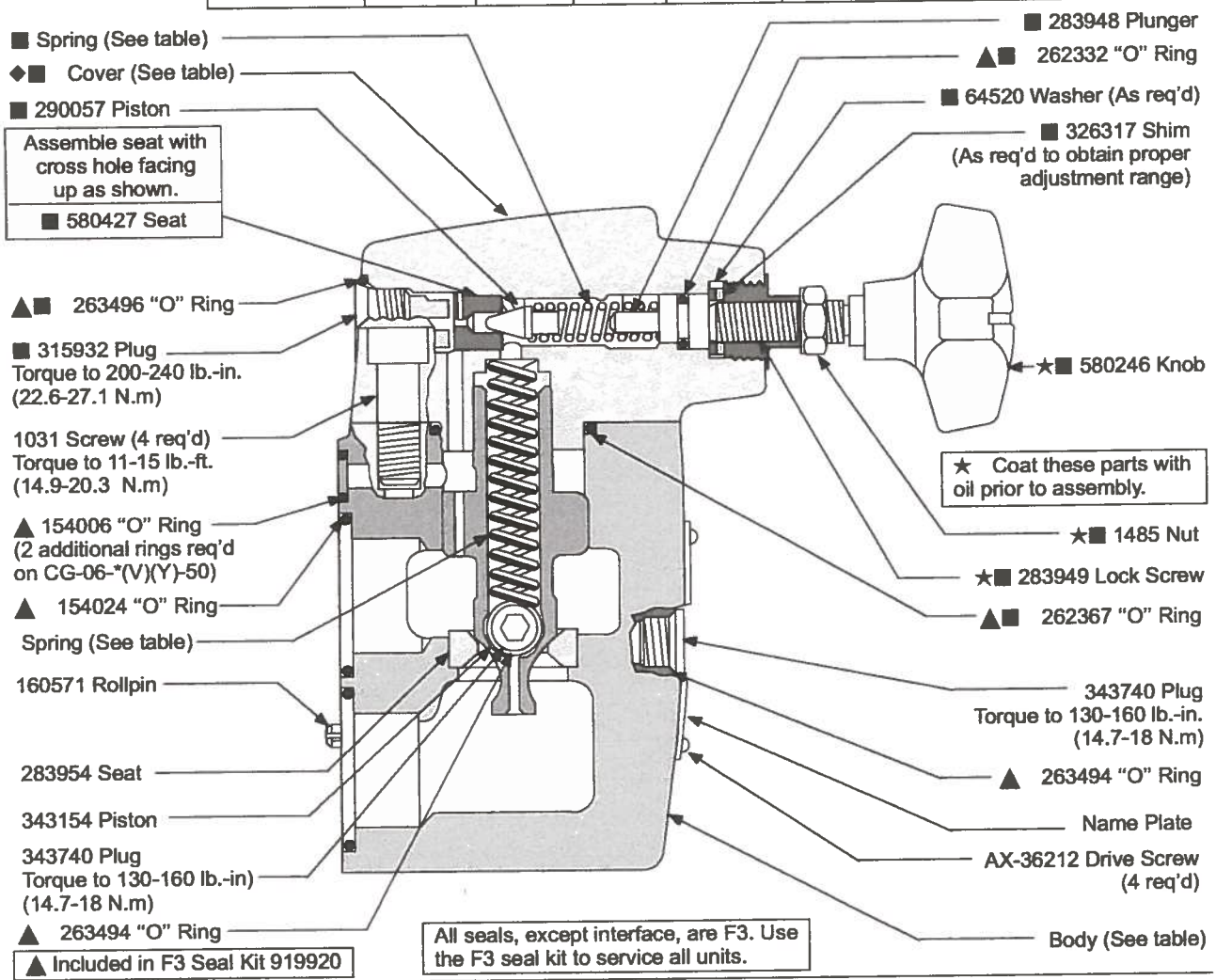
Vickers®

Relief Valves

Balanced Piston Type Relief & Sequence Valves

CG-10-***-30

Model	■ Cover	Body	Spring	■ Spring	Pressure Range PSI	■ Included in Cover S/A
CG-10-B-30	581700	581703	291822	2280	125-1000	941286
CG-10-BV-30			291821			–
CG-10-BVY-30	590299	591450				
CG-10-BY-30			291822	583937	500-2000	941287
CG-10-C-30	581700	581703				
CG-10-CV-30			291821			–
CG-10-CVY-30	590299	591450				
CG-10-CY-30			291822	2281	1500-3000	941288
CG-10-F-30	581700	581703				
CG-10-FV-30			291821			–
CG-10-FVY-30	590299	591450				
CG-10-FY-30			291822			


■ Spring (See table)
◆■ Cover (See table)
■ 290057 Piston
Assemble seat with cross hole facing up as shown.
■ 580427 Seat
▲■ 263496 "O" Ring
■ 315932 Plug
Torque to 200-240 lb.-in. (22.6-27.1 N.m)
1031 Screw (4 req'd)
Torque to 11-15 lb.-ft. (14.9-20.3 N.m)
▲ 154006 "O" Ring
(2 additional rings req'd on CG-06-*(V)(Y)-50)
▲ 154024 "O" Ring
Spring (See table)
160571 Rollpin
283954 Seat
343154 Piston
343740 Plug
Torque to 130-160 lb.-in) (14.7-18 N.m)
▲ 263494 "O" Ring
▲ Included in F3 Seal Kit 919920
■ 283948 Plunger
▲■ 262332 "O" Ring
■ 64520 Washer (As req'd)
■ 326317 Shim
(As req'd to obtain proper adjustment range)
★■ 580246 Knob
★ Coat these parts with oil prior to assembly.
★■ 1485 Nut
★■ 283949 Lock Screw
▲■ 262367 "O" Ring
343740 Plug
Torque to 130-160 lb.-in. (14.7-18 N.m)
▲ 263494 "O" Ring
Name Plate
AX-36212 Drive Screw (4 req'd)
Body (See table)
All seals, except interface, are F3. Use the F3 seal kit to service all units.

Released 07–1–85

VICKERS

Model Code Breakdown

(F3) C G - 10 - * - (V) (Y) - 50

1 2 3 4 5 6 7

1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a regsitered trademark of E.I. DuPont

2 Model Series

CG - Relief valve, manifold or subplate mounted

3 Size

10 - 1-1/4 inch

4 Pressure Range

B - 125-1000
C - 500-2000
F - 1500-3000

5 Vent Pressure

V - High vent pressure
(Omit for standard vent pressure.)

6 External Drain Feature

Y - Sequence valve
(Omit for standard relief.)

7 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

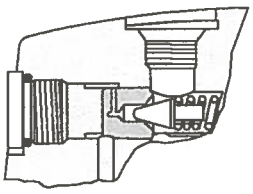
Service Data

Vickers®

Relief Valves

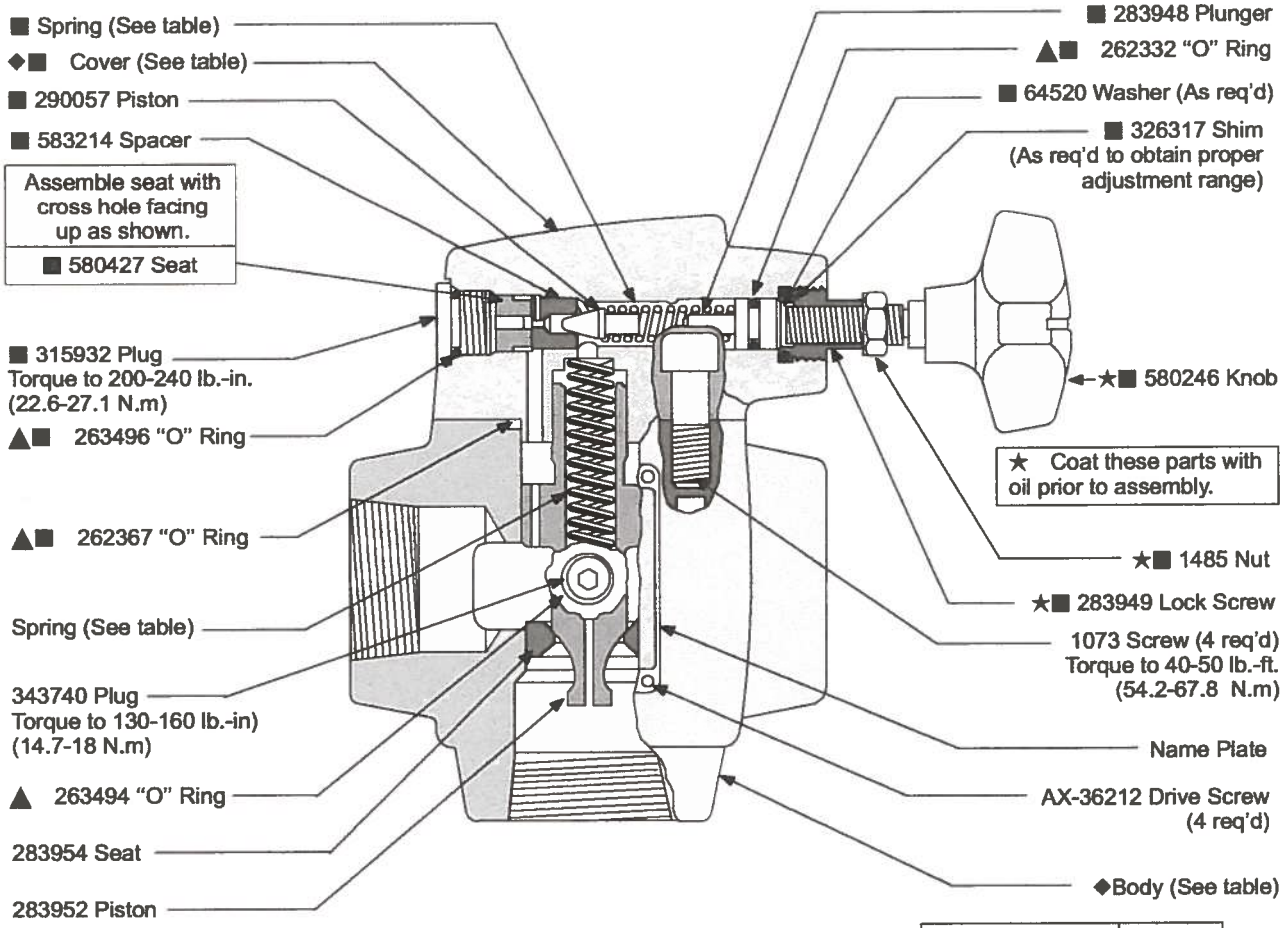
Balanced Piston Type Relief Valves

(F3)C*-10-*(V)(Y)-30



"Y" Cover Assembly
(See Table)

Model	■◆ Cover	Spring	■ Spring	Pressure Range PSI	■ Included in Cover S/A
C*-10-B-30	581700	291822	2280	125-1000	941286
C*-10-BV-30		291821			–
C*-10-BVY-30	590304				
C*-10-BY-30		291822			
C*-10-C-30	581700		583937	500-2000	941287
C*-10-CV-30		291821			–
C*-10-CVY-30	590304				
C*-10-CY-30		291822			
C*-10-F-30	581700		2281	1500-3000	941288
C*-10-FV-30		291821			926596
C*-10-FVY-30	590304				
C*-10-FY-30		291822			



Model	◆Body
CS-10-*(V)(Y)-30	580430
CT-10-*(V)(Y)-30	590300

◆Not available for sale.

▲ Included in F3 Seal Kit 920225

All seals, except interface, are F3. Use the F3 seal kit to service all units.

CT-10

Model Code Breakdown

(F3) C * -10 - * - (V) (Y) - 50

1 2 3 4 5 6 7 8

1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a regsitered trademark of E.I. DuPont

2 Model Series

C - Relief valve

3 Threads

S - SAE straight
T - NPTF pipe

4 Size

10 - 1-1/4 inch

5 Pressure Range

B - 125-1000
C - 500-2000
F - 1500-3000

6 Vent Pressure

V - High vent pressure
(Omit for standard vent pressure.)

7 External Drain Feature

Y - Sequence valve
(Omit for standard relief.)

8 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

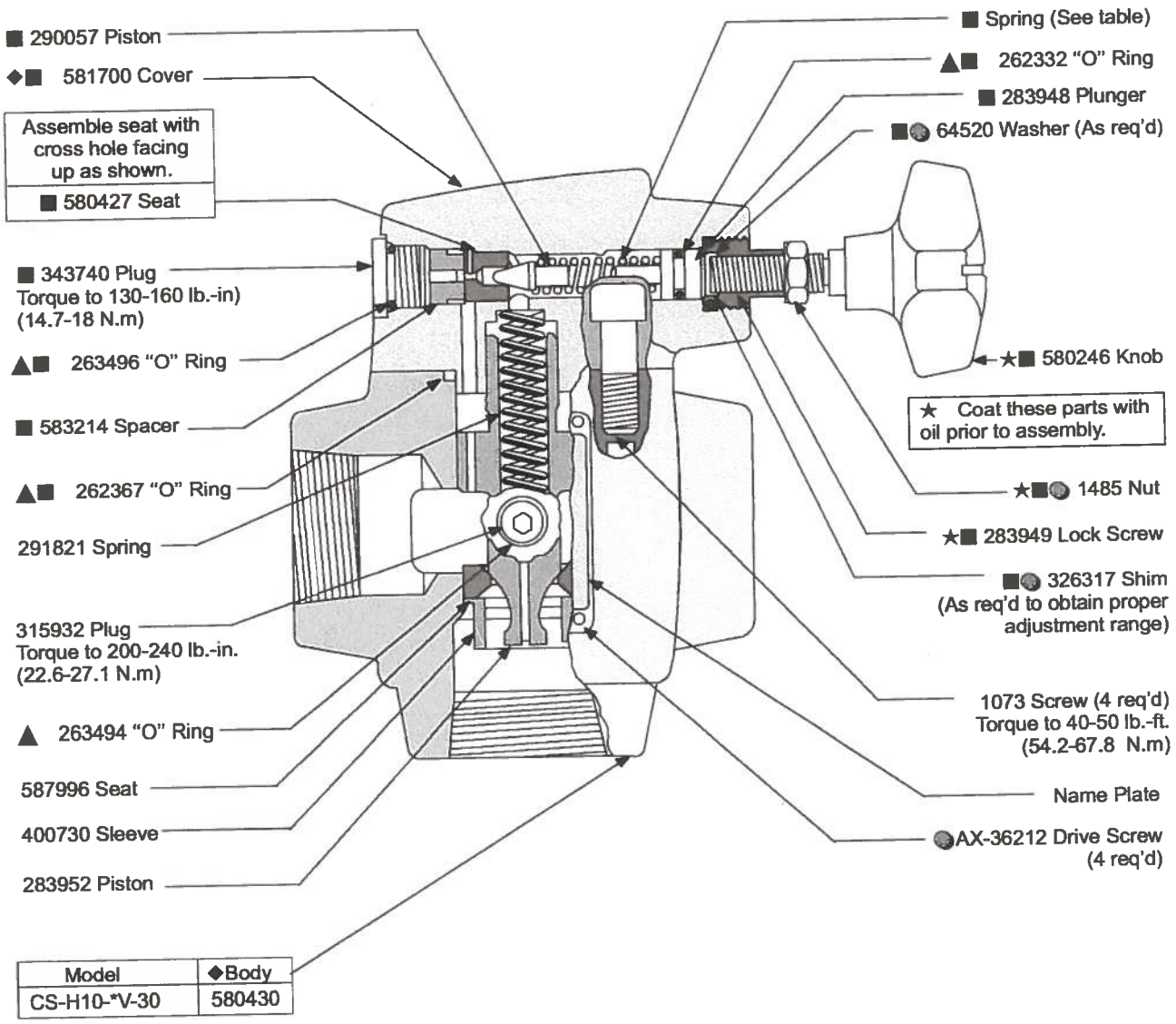
EATON

Balanced Piston Type Relief Valves

(F3)CS-H10-*(V)-30

Available in lot kits of 25 pieces

Model	■ Spring	Pressure Range PSI	■ Included in Cover S/A
C*-H10-BV-30	2280	125-1000	941286
C*-H10-CV-30	583937	500-2000	941287
C*-H10-FY-30	2281	1500-3000	941288



Model	◆Body
CS-H10-*V-30	580430

◆Not available for sale.

▲ Included in F3 Seal Kit 920225

Model Code Breakdown

(F3) C * - H10 - * - (V) - 50

1 2 3 4 5 6 7

1 Seals

F3 - Multi-fluid capability (Viton® seals)

Viton is a regsitered trademark of E.I. DuPont

2 Model Series

C - Relief valve

3 Threads

S - SAE straight

4 Size

H10 - 1-1/4 inch high flow

5 Pressure Range

B - 125-1000
C - 500-2000
F - 1500-3000

6 Vent Pressure

V - High vent pressure

7 Design

For satisfactory service life of these components, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. Selections from Eaton OFP,OFR and OFRS filter series are recommended.

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

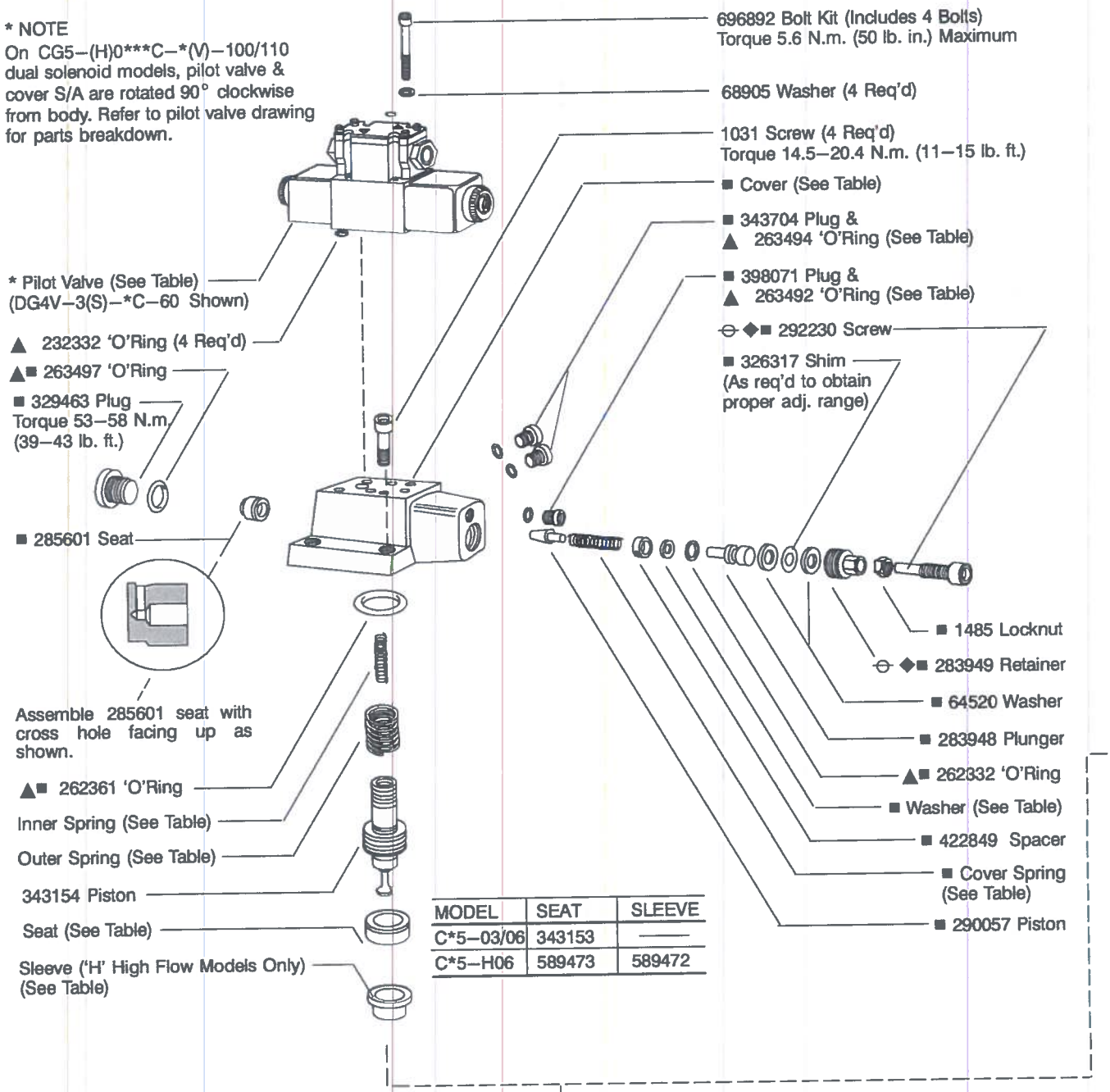
Solenoid Controlled Pilot Operated Relief Valves

(F3)–C/G/S/T5–(H)–03/06*(V)**(V)–M–(S*)*****(L)******–100/110–EN****

VICKERS

Released 06–01–91

I–3780–S


* NOTE
On CG5–(H)0***C–*(V)–100/110 dual solenoid models, pilot valve & cover S/A are rotated 90° clockwise from body. Refer to pilot valve drawing for parts breakdown.
696892 Bolt Kit (Includes 4 Bolts) Torque 5.6 N.m. (50 lb. in.) Maximum
68905 Washer (4 Req'd)
1031 Screw (4 Req'd) Torque 14.5–20.4 N.m. (11–15 lb. ft.)
■ Cover (See Table)
■ 343704 Plug &
▲ 263494 'O'Ring (See Table)
■ 398071 Plug &
▲ 263492 'O'Ring (See Table)
⊖ ◆■ 292230 Screw
■ 326317 Shim (As req'd to obtain proper adj. range)
* Pilot Valve (See Table) (DG4V–3(S)–*C–60 Shown)
▲ 232332 'O'Ring (4 Req'd)
▲■ 263497 'O'Ring
■ 329463 Plug Torque 53–58 N.m. (39–43 lb. ft.)
■ 285601 Seat
Assemble 285601 seat with cross hole facing up as shown.
▲■ 262361 'O'Ring
Inner Spring (See Table)
Outer Spring (See Table)
343154 Piston
Seat (See Table)
Sleeve ('H' High Flow Models Only) (See Table)
■ 1485 Locknut
⊖ ◆■ 283949 Retainer
■ 64520 Washer
■ 283948 Plunger
▲■ 262332 'O'Ring
■ Washer (See Table)
■ 422849 Spacer
■ Cover Spring (See Table)
■ 290057 Piston
▲ 263494 'O'Ring
343740 Plug Torque 15.0–16.6 N.m. (133–147 lb. in.)
Diagram Plate (See Table)
AX–36212 Screw (4 Req'd)
◆ Body (See Table)

MODEL	SEAT	SLEEVE
C*5–03/06	343153	——
C*5–H06	589473	589472

MODEL	■COVER S/A
C*5–(H)0*0A/F–B(V)–100/110	942432
C*5–(H)0*0A/F–C(V)–100/110	942433
C*5–(H)0*0A/F–F(V)–100/110	942434
C*5–(H)0*1A–B(V)–100/110	942435
C*5–(H)0*2A–B(V)–100/110	
C*5–(H)0**C–B(V)–100/110	
C*5–(H)0*1A–C(V)–100/110	942436
C*5–(H)0*2A–C(V)–100/110	
C*5–(H)0**C–C(V)–100/110	
C*5–(H)0*1A–F(V)–100/110	942437
C*5–(H)0*2A–F(V)–100/110	
C*5–(H)0**C–F(V)–100/110	

MODEL	◆ BODY
CS5–03**–*–100/110	590407
CS5–(H)06**–*(V)–100/110	581701
CT5–06**–*–100/110	590348

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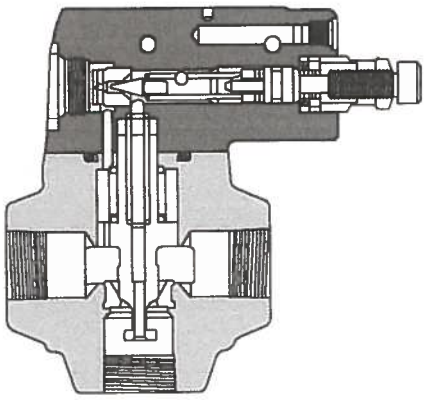
MODEL	DIAGRAM PLATE	* PILOT VALVE
C*5 –(H)0*0A(P)–*(V)–M–***–100	422864	DG4V–3S–0BL–M***–60
C*5 –(H)0*0A(P)–*(V)–M–***–110		DG4V–3–0BL–M***–60
C*5 –(H)0*1A(P)–*(V)–M–***–100	422865	DG4V–3S–2AL–M***–60
C*5 –(H)0*1A(P)–*(V)–M–***–110		DG4V–3–2AL–M***–60
C*5 –(H)0*2A(P)–*(V)–M–***–100	423814	DG4V–3S–2BL–M***–60
C*5 –(H)0*2A(P)–*(V)–M–***–110		DG4V–3–2BL–M***–60
C*5 –(H)0*0C–*(V)–M–***–100	422862	DG4V–3S–0C–M***–60
C*5 –(H)0*0C–*(V)–M–***–110		DG4V–3–0C–M***–60
C*5 –(H)0*2C–*(V)–M–***–100	422863	DG4V–3S–2C–M***–60
C*5 –(H)0*2C–*(V)–M–***–110		DG4V–3–2C–M***–60
C*5 –(H)0*0F(P)–*(V)–M–***–100	477211	DG4V–3S–0FL–M***–60
C*5 –(H)0*0F(P)–*(V)–M–***–110		DG4V–3–0FL–M***–60

* Refer to pilot valve drawing for parts breakdown.



Relief valve sectional view without pilot valve

MODEL	■COVER	■PLUG/'O'RING (2 REQ'D)	■PLUG/'O'RING
C*5–(H)0*0A–100/110	422828	——	——
C*5–(H)0*1A–100/110	424203	343740/▲ 263494	398071/▲ 263492
C*5–(H)0*2A–100/110			
C*5–(H)0**C–100/110			

MODEL	■ WASHER	INNER SPRING	OUTER SPRING	■ COVER SPRING
C*5–0***–B–100/110	——	2077	——	2280
C*5–H0***–BV–100/110		——	184458	
C*5–0***–C–100/110	233110	2077	——	583937
C*5–H0***–CV–100/110		——	184458	
C*5–0***–F–100/110	——	2077	——	2281
C*5–H0***–FV–100/110		——	184458	

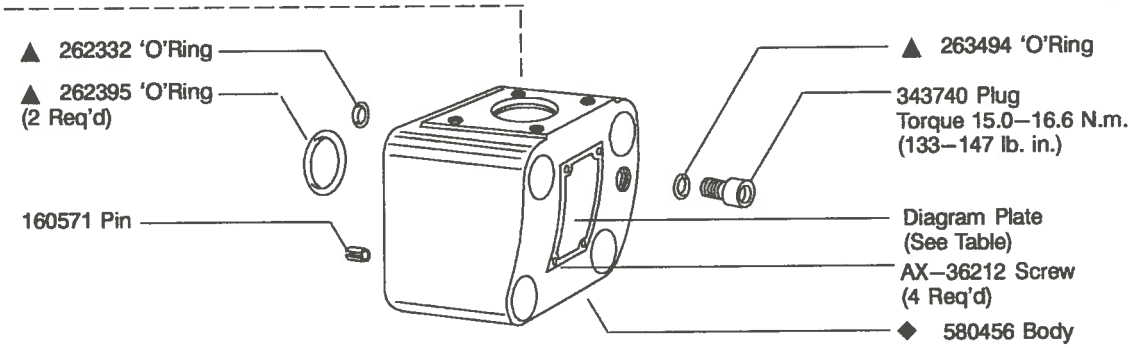
■ Included In Cover S/A

⊖ Lubricate With Oil Before Assembly

▲ Included In F3 Seal Kit 696929 (includes pilot valve seals)

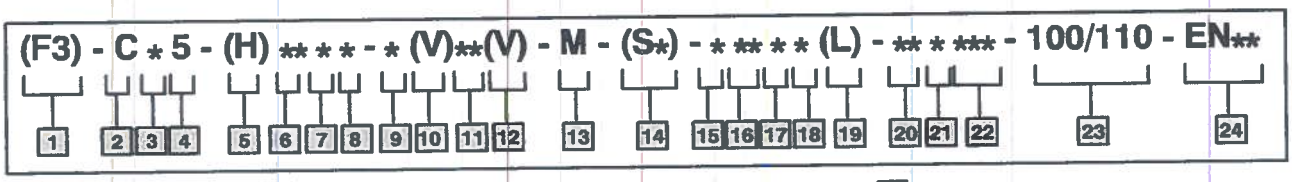
◆ Not Available For Sale

NOTE
Parts Prefixed With A Symbol Available Only In Kits.


▲ 262332 'O'Ring
▲ 262395 'O'Ring (2 Req'd)
160571 Pin
▲ 263494 'O'Ring
343740 Plug Torque 15.0–16.6 N.m. (133–147 lb. in.)
Diagram Plate (See Table)
AX–36212 Screw (4 Req'd)
◆ 580456 Body

CG5–(H)06

Model Code



1 Seals for mineral oil & fire resistant fluids

2 Relief valve

3 Connections

G – Subplate mounting
S – Straight threads
T – NPTF threads

4 Solenoid controlled

5 High flow
Omit for standard models

6 Valve size

03 – 3/8"–.8750 straight thread
06 – 3/4"–1.0625 straight thread or 3/4" NPTF

7 Pilot spool function

0,1, or 2 Indicates venting condition

8 Pilot spool spring arrangement

A – Spring offset
C – Spring centered
F – Spring centered, shift to center

9 Pressure range

B – 125–1000 psi
C – 500–2000 psi
F – 1500–3000 psi

10 High vent (Req'd for high flow models)

Blank – Omit for low vent models

11 Manual override options (included in pilot valve model code)

Blank – Plain override solenoid ends only
H – Waterproof override solenoid ends only
H2 – Waterproof override both ends of single solenoid
M – Serviceable manual overrides in solenoid ends only
P2 – Plain override both ends of single solenoid
Y – Lockable manual overrides solenoid ends only
Z – No overrides in either end

12 Solenoid energization identity

Blank – Standard arrangement for ANSI B93 9 (energise solenoid A for flow P to A port)
V – Solenoid identification determined by position of solenoid. (Solenoid A at port A end and/or solenoid B at port B end.
(All 4 & 8 spools are always V code)

13 Flag symbol heading electrical options & features

14 Spool position monitoring switch (tank pressure rating 10 bar only)

S1 – Switch, normally open, U coils only
S2 – Switch, normally closed, U coils only
S3 – Switch, wired normally open, P*
S4 – Switch, wired normally closed, P*
S5 – Switch, free leads, FW & FJ only

15 Coil type

U – ISO 4400
F – Flying lead
SP1 – Single 6,3 series spade to IEC 760
SP2 – Dual 6,3 series spade to IEC 760

16 Electrical connections (F type coil only) omit if not required

T – Wired terminal block
PA – Instaplug male receptacle only
PB – Instaplug male & female receptacle
PA3 – Three pin connector
PA5 – Five pin connector

17 Housing (F type coils only)

W – 1/2 NPT thread wiring housing
J – 20 mm thread wiring housing

18 Electrical options

1 – ISO with fitted plug, U type coils only
6 – ISO with fitted plug, with lights, U type coils only

19 Solenoid indicator lights (F build only) To be used with T terminal block models.
(Omit if not required)

20 Coil indentification

21 Pilot valve code (tank pressure rating)

2 – 10 bar (145 psi) use with switch models S*
5 – 100 bar (1450 psi) DG4V–3S–60
6 – 160 bar (2300 psi) DG4V–3–60
7 – 210 bar (3000 psi) DG4V–3–60

22 Pilot valve port orifices

23 Design

100 – DG4V3S–60
Standard pilot valve
110 – DG4V3–60
High performance pilot valve

24 Special modifications (omit if not required)

11 Thru 22 included in pilot valve model code

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

Solenoid Controlled Pilot Operated Relief Valves

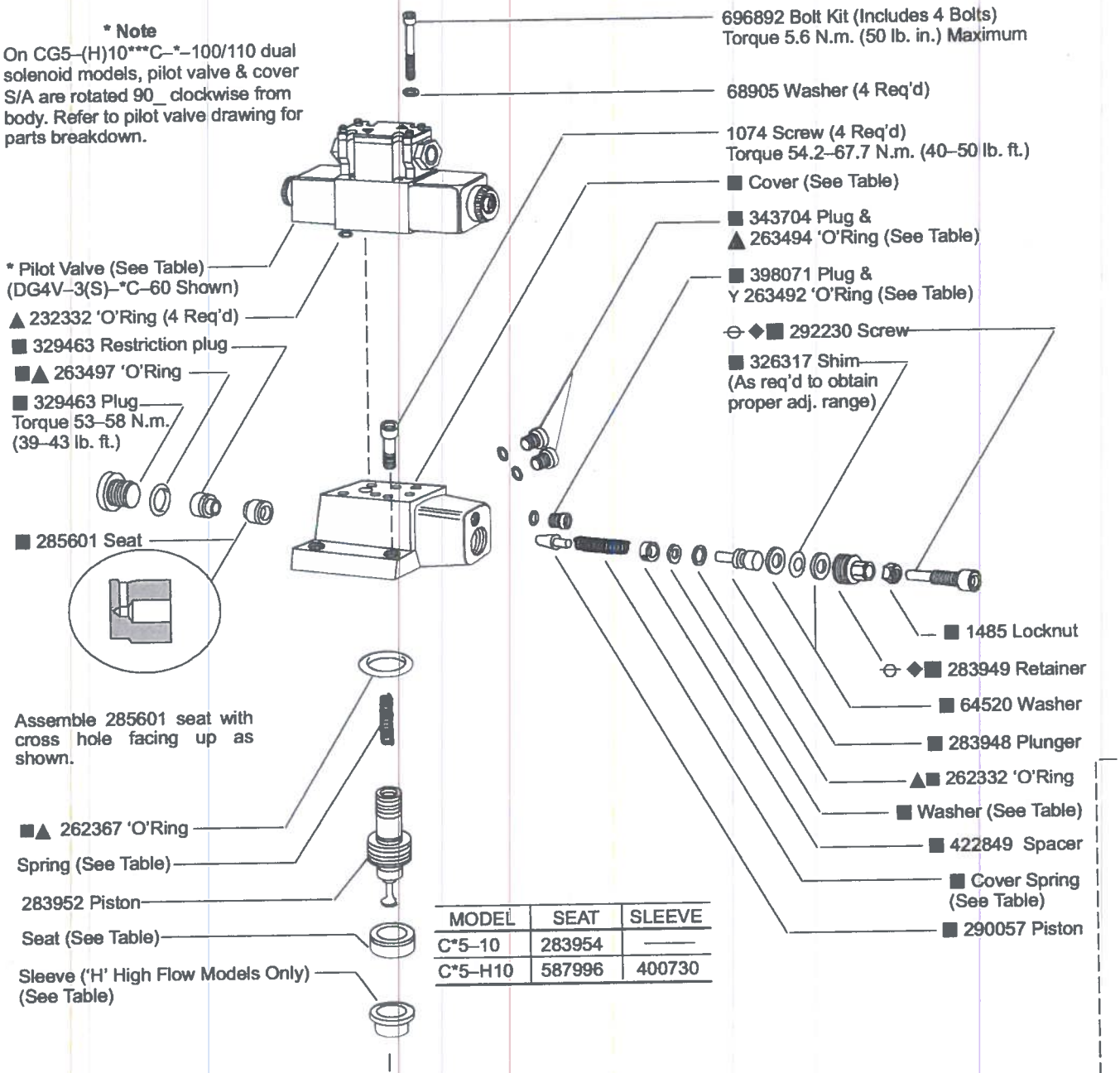
(F3)–C/G/S/T5–(H)–10*(V)**(V)–M–(S*)*****(L)******–100/110–EN****

VICKERS

Revised 12-01-96

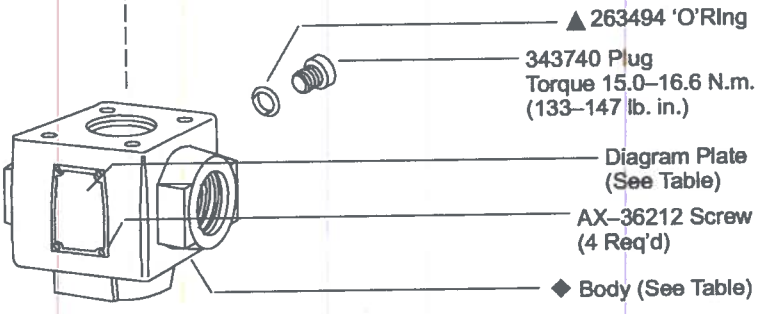
I–3781–S

*** Note**
On CG5–(H)10***C–*–100/110 dual solenoid models, pilot valve & cover S/A are rotated 90_ clockwise from body. Refer to pilot valve drawing for parts breakdown.



MODEL	SEAT	SLEEVE
C*5–10	283954	——
C*5–H10	587996	400730

MODEL	■ COVER S/A
C*5–(H)100A/F–B(V)–100/110	942456
C*5–(H)100A/F–C(V)–100/110	942457
C*5–(H)100A/F–F(V)–100/110	942458
C*5–(H)101A–B(V)–100/110	942459
C*5–(H)102A–B(V)–100/110	
C*5–(H)10*C–B(V)–100/110	
C*5–(H)101A–C(V)–100/110	942460
C*5–(H)102A–C(V)–100/110	
C*5–(H)10*C–C(V)–100/110	
C*5–(H)101A–F(V)–100/110	942461
C*5–(H)102A–F(V)–100/110	
C*5–(H)10*C–F(V)–100/110	



MODEL	◆ BODY
CT5–10**–*–100/110	590300
CS5–(H)10**–*–100/110	580430

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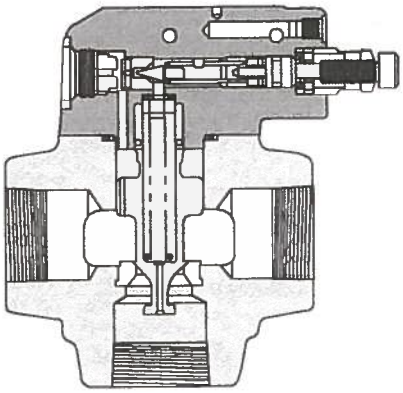
MODEL	DIAGRAM PLATE	* PILOT VALVE
C*5–(H)100A(P)–*(V)–M–***–100	422864	DG4V–3S–0BL–M***–60
C*5–(H)100A(P)–*(V)–M–***–110		DG4V–3–0BL–M***–60
C*5–(H)101A(P)–*(V)–M–***–100	422865	DG4V–3S–2AL–M***–60
C*5–(H)101A(P)–*(V)–M–***–110		DG4V–3–2AL–M***–60
C*5–(H)102A(P)–*(V)–M–***–100	423814	DG4V–3S–2BL–M***–60
C*5–(H)102A(P)–*(V)–M–***–110		DG4V–3–2BL–M***–60
C*5–(H)100C–*(V)–M–***–100	422862	DG4V–3S–0C–M***–60
C*5–(H)100C–*(V)–M–***–110		DG4V–3–0C–M***–60
C*5–(H)102C–*(V)–M–***–100	422863	DG4V–3S–2C–M***–60
C*5–(H)102C–*(V)–M–***–110		DG4V–3–2C–M***–60
C*5–(H)100F(P)–*(V)–M–***–100	———	DG4V–3S–0FL–M***–60
C*5–(H)100F(P)–*(V)–M–***–110		DG4V–3–0FL–M***–60

* Refer to pilot valve drawing for parts breakdown.



Relief valve sectional view without pilot valve

MODEL	■ COVER	■ PLUG/'O'RING (2 REQ'D)	■ PLUG/'O'RING
C*5–(H)100A–100/110	422852	———	———
C*5–(H)101A–100/110	424204	343740/▲263494	398071/▲263492
C*5–(H)102A–100/110			
C*5–(H)10*C–100/110			

MODEL	■ WASHER	■ COVER SPRING	SPRING
C*5–10**–B–100/110	———	2280	291822
C*5–H10**–BV–100/110			291821
C*5–10**–C–100/110	233110	583937	291822
C*5–H10**–CV–100/110			291821
C*5–10**–F–100/110	———	2281	291822
C*5–H10**–FV–100/110			291821

■ Included In Cover S/A

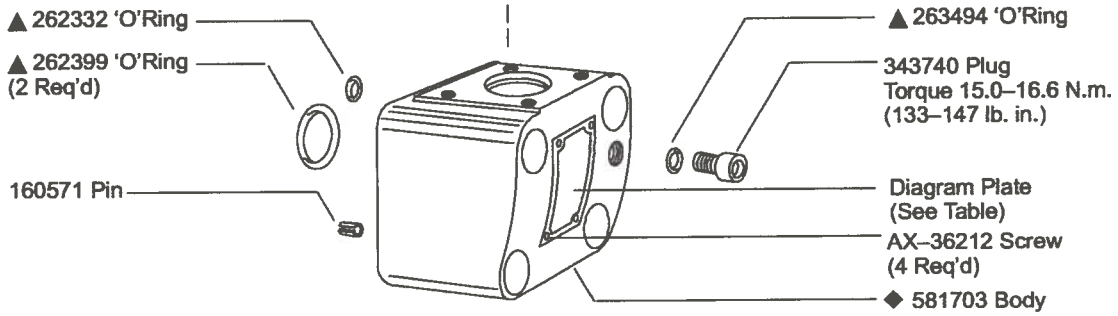
▲ Included In F3 Seal Kit 696930 (includes pilot valve seals)

⊖ Lubricate With Oil Before Assembly

◆ Not Available For Sale

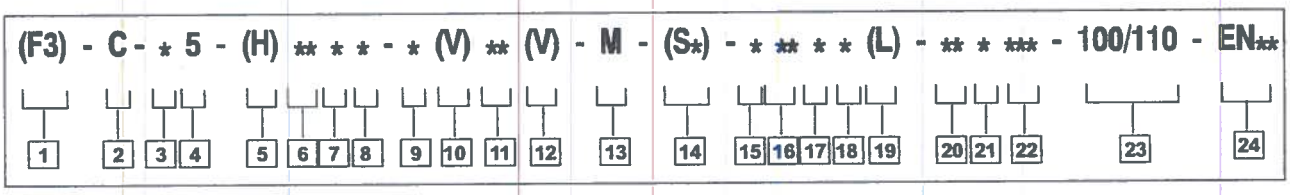
Note

Parts Prefixed With A Symbol Available Only In Kits.


▲ 262332 'O'Ring
▲ 262399 'O'Ring (2 Req'd)
160571 Pin
▲ 263494 'O'Ring
343740 Plug Torque 15.0–16.6 N.m. (133–147 lb. in.)
Diagram Plate (See Table)
AX–36212 Screw (4 Req'd)
◆ 581703 Body

CG5–(H)10–*–100/110**

Model Code



1 Seals for mineral oil & fire resistant fluids

2 Relief valve

3 Connections

G – Subplate mounting
S – Straight threads
T – NPTF threads

4 Solenoid controlled

5 High flow
Omit for standard models

6 Valve size

10 – 1–1/4"–1.6250 straight thread or 1–1/4" NPTF

7 Pilot spool function

0,1, or 2 Indicates venting condition

8 Pilot spool spring arrangement

A – Spring offset
C – Spring centered
F – Spring centered, shift to center

9 Pressure range

B – 125–1000 psi
C – 500–2000 psi
F – 1500–3000 psi

10 High vent (Req'd for high flow models)

Blank – Omit for low vent models

11 Manual override options (included in pilot valve model code)

Blank – Plain override solenoid ends only
H – Waterproof override solenoid ends only
H2 – Waterproof override both ends of single solenoid
M – Serviceable manual overrides in solenoid ends only
P2 – Plain override both ends of single solenoid
Y – Lockable manual overrides solenoid ends only
Z – No overrides in either end

12 Solenoid energization identity

Blank – Standard arrangement for ANSI B93 9 (energise solenoid A for flow P to A port)
V – Solenoid identification determined by position of solenoid. (Solenoid A at port A end and/or solenoid B at port B end.
(All 4 & 8 spools are always V code)

13 Flag symbol heading electrical options & features

14 Spool position monitoring switch (tank pressure rating 10 bar only)

S1 – Switch, normally open, U coils only
S2 – Switch, normally closed, U coils only
S3 – Switch, wired normally open, P*
S4 – Switch, wired normally closed, P*
S5 – Switch, free leads, FW & FJ only

15 Coil type

U – ISO 4400
F – Flying lead
SP1 – Single 6,3 series spade to IEC 760
SP2 – Dual 6,3 series spade to IEC 760

16 Electrical connections (F type coil only) omit if not required

T – Wired terminal block
PA – Instaplug male receptacle only
PB – Instaplug male & female receptacle
PA3 – Three pin connector
PA5 – Five pin connector

17 Housing (F type coils only)

W – 1/2 NPT thread wiring housing
J – 20 mm thread wiring housing

18 Electrical options

1 – ISO with fitted plug, U type coils only
6 – ISO with fitted plug, with lights, U type coils only

19 Solenoid indicator lights (F build only) To be used with T terminal block models.
(Omit if not required)

20 Coil indentification

21 Pilot valve code (tank pressure rating)

2 – 10 bar (145 psi) use with switch models S*
5 – 100 bar (1450 psi) DG4V–3S–60
6 – 160 bar (2300 psi) DG4V–3–60
7 – 210 bar (3000 psi) DG4V–3–60

22 Pilot valve port orifices

23 Design

100 – DG4V3S–60
Standard pilot valve
110 – DG4V3–60
High performance pilot valve

24 Special modifications (omit if not required)

11 Thru 22 included in pilot valve model code

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

Multi—Pressure Relief Valves

(F3)—C/G/S/T—06/10(*)(V)—DG—OA(L)**—(V)M—(S*)*****(L)******—40/50**

VICKERS

Released 07—01—91

I—3782—S

NOTE: Lubricate all parts & seals with a thin coat of oil at assembly.

Caution
Use only a DG4V3(S)–OA–60 or DG4V3(S)–OAL–60 directional valve as a pilot for this relief valve. Use of a different pilot can block relief valve, causing excessive system pressure.

DG4V3(S)–OA(L)–60 Pilot valve (Refer to parts drawing for detailed information).

255698 Bolt kit (Torque 4.5–5.6 N.m.) 40–50 lb.in. (Pilot valve to adapter plate mounting) Not shown

255651 Bolt kit (Torque 14.9–20.3 N.m.) 11–15 lb.ft. (Adapter plate to cover mounting)

422814 Adapter plate

○●△▲ 263497 "O"Ring (2 Req'd)

○●♠ 329463 Plug (3 Req'd) Torque 52.8–58.3 N.m. (39–43 lb. ft.)

♠ 113000 Plug (4 Req'd)

△▲ 262334 "O"Ring (4 Req'd)

○ 294656 Restrictor plug (2 Req'd) C*–10 only

○● 285601 Seat (2 Req'd) Assemble cross hole facing up

○● Cover (see table)

♠ 226816 Rollpin

○● 290057 Piston (2 Req'd)

Lockwasher (see table)

○● Cover spring (see table)

Screw (see table)

○●△▲ 262332 "O"Ring (2 Req'd)

♠ 113000 Plug
● (C*–06 5 Req'd)
○ (C*–10 7 Req'd)

○●△▲ 197570 BU–Ring (2 Req'd)

○● 370701 Plunger (2 Req'd)

○● 370839 Warning plate

○●♠ 227405 Screw (4 Req'd)

Hi–Vent spring (C*–10) See table
Lo–Vent spring (C*–06/10) See table

Hi–Vent spring (C*–06 only) See table

Hydrocone (see table)

Seat (see table)

△▲ 262361 "O"Ring (C*–06)
262367 "O"Ring (C*–10)

○●✳♠ 292230 ADJ. screw (2 Req'd)

○●✳♠ 1485 Locknut (2 Req'd)

○●✳♠ 283949 Lockscrew (2 Req'd)

○●□♠ 64520 Washer (As req'd)

○●□♠ 326317 Washer (As req'd)

✳ NOTE: Coat 292230 ADJ. screw, 283949 lockscrew and 1485 locknut with oil prior to assembly.

□ NOTE: These parts used at final test to obtain correct pressure range.

Model	Seat	Hydrocone	Lo–Vent spring	Hi–Vent spring	Cover
C*–06	343153	343154	2077	184458	● 370666
C*–10	283954	283952	291822	291821	○ 370671

NOTE: Use either a Lo–Vent or Hi–Vent spring. Do not use both. (See model code)

NOTE
For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. OFP, OFR, and OFRS series filters are recommended.

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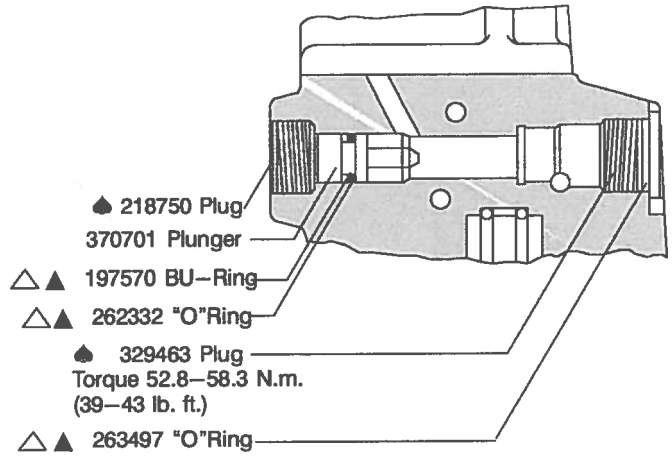
Model	Screw (4 Req'd)	Torque		Lock washer (4 Req'd)
		lb. ft.	N.m	
C*–06	1036	11–15	14.9–20.3	68907
C*–10	1076	35–43	47.5–58.3	68909

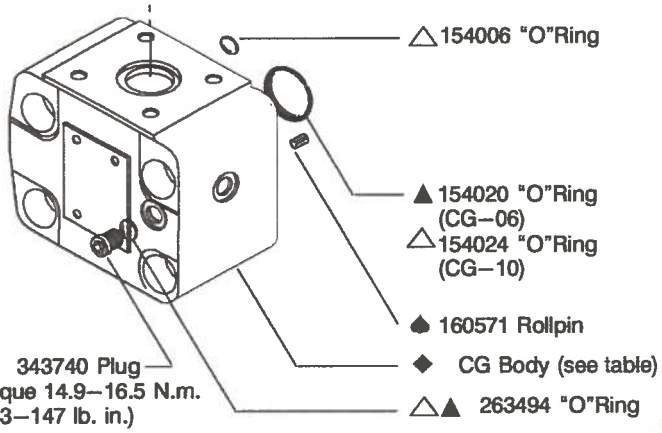
Sectional "E" vent head 1 or 3



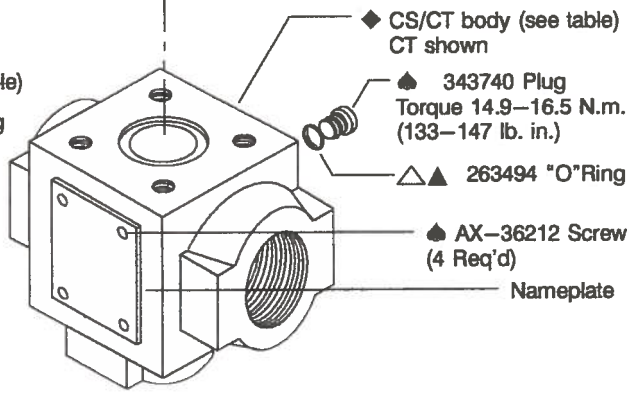
Model	Cover spring	Pressure range psi (bar)
C*–**–B	2280	125–1000 (8.5–70)
C*–**–C	583937	500–2000 (35–140)
C*–**–F	2281	1500–3000 (105–210)

♠ Part	Kit
1485	944064
AX–36212	944053
64520	944068
113000	944055
160571	944069
218750	944070
226816	944071
227405	944074
292230	944072
326317	944073
329463	944041
343740	944038

Parts with ♠ available only in kits of 25.
Reference kit on parts order.



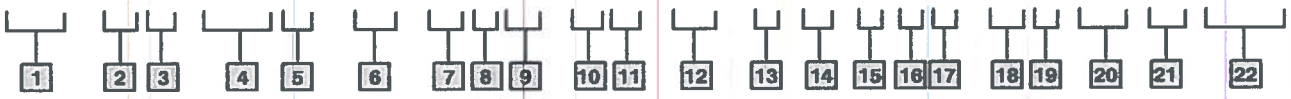
Model	◆ Body	
	–06	–10
CG	580456	581703
CS	581701	580430
CT	590348	590300



▲ Included in –06 F3 seal kit 919684
△ Included in –10 F3 seal kit 919685
● Included in CT–06–BC cover kit 942155
○ Included in CT–10–BC cover kit 942156
♠ Available only in kits of 25.
◆ Not available for sale

Model Code

(F3) - C* ** - **(*)(V) - DG - **(L) - (V)M - (S*) - * - ** - * - *(L) - ** * - *** - ** - EN****



1 Seals for mineral oil & fire resistant fluids

2 Relief valve connections

G – Subplate mounting
S – Straight threads
T – NPTF threads

3 Valve size

06 – 3/4"
10 – 1–1/4"

4 Pressure range

B – 125–1000 psi
C – 500–2000 psi
F – 1500–3000 psi
E – Vent

5 High vent

Blank – Omit for low vent models

6 Directional valve

7 Spool type & spring arrangement

0A(L) – Spring offset

8 Left hand build
Omit for standard models

9 Manual override options (included in pilot valve model code)

Blank – Plain override solenoid ends only
H – Waterproof override solenoid ends only
H2 – Waterproof override both ends of single solenoid
M – Serviceable manual overrides in solenoid ends only
P2 – Plain override both ends of single solenoid
Y – Lockable manual overrides solenoid ends only
Z – No overrides in either end

10 Solenoid energization identity

Blank – Standard arrangement for ANSI B93.9 (energise solenoid A for flow P to A port)
V – Solenoid identification determined by position of solenoid. (Solenoid A at port A end and/or solenoid B at port B end.
(All 4 & 8 spools are always V code)

11 Flag symbol heading electrical options & features

12 Spool position monitoring switch (tank pressure rating 10 bar only)

S1 – Switch, normally open, U coils only
S2 – Switch, normally closed, U coils only
S3 – Switch, wired normally open, P*
S4 – Switch, wired normally closed, P*
S5 – Switch, free leads, FW & FJ only
Omit if not required

13 Coil type

U – ISO 4400
P – Plug in coil
F – Flying lead
SP1 – Single 6,3 series spade to IEC 760
SP2 – Dual 6,3 series spade to IEC 760

14 Electrical connections (F type coil only) omit if not required

T – Wired terminal block
PA – Instaplug male receptacle only
PB – Instaplug male & female receptacle
PA3 – Three pin connector & terminal block
PA5 – Five pin connector & terminal block

15 Housing (F type coils only)

W – 1/2 NPT thread wiring housing
J – 20 mm thread wiring housing

16 Electrical options

1 – ISO with fitted plug, U type coils only
7 – Surge damper, P type coils only
9 – Rectifier (fast type) P type coils only
12 – Rectifier (slow type) P type coils only

17 Solenoid indicator lights (F build only) To be used with T terminal block models.
(Omit if not required)

18 Coil indentification

19 Pilot valve code (tank pressure rating)

2 – 10 bar (145 psi) use with switch models S*
5 – 100 bar (1450 psi) for all other models

20 Pilot valve port orifices

21 Design

40 – DG4V3S–60
Standard pilot valve
50 – DG4V3–60
High performance pilot valve

22 Special modifications (omit if not required)

7 Thru 20 included in pilot valve model code

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

Multi—Pressure Relief Valves

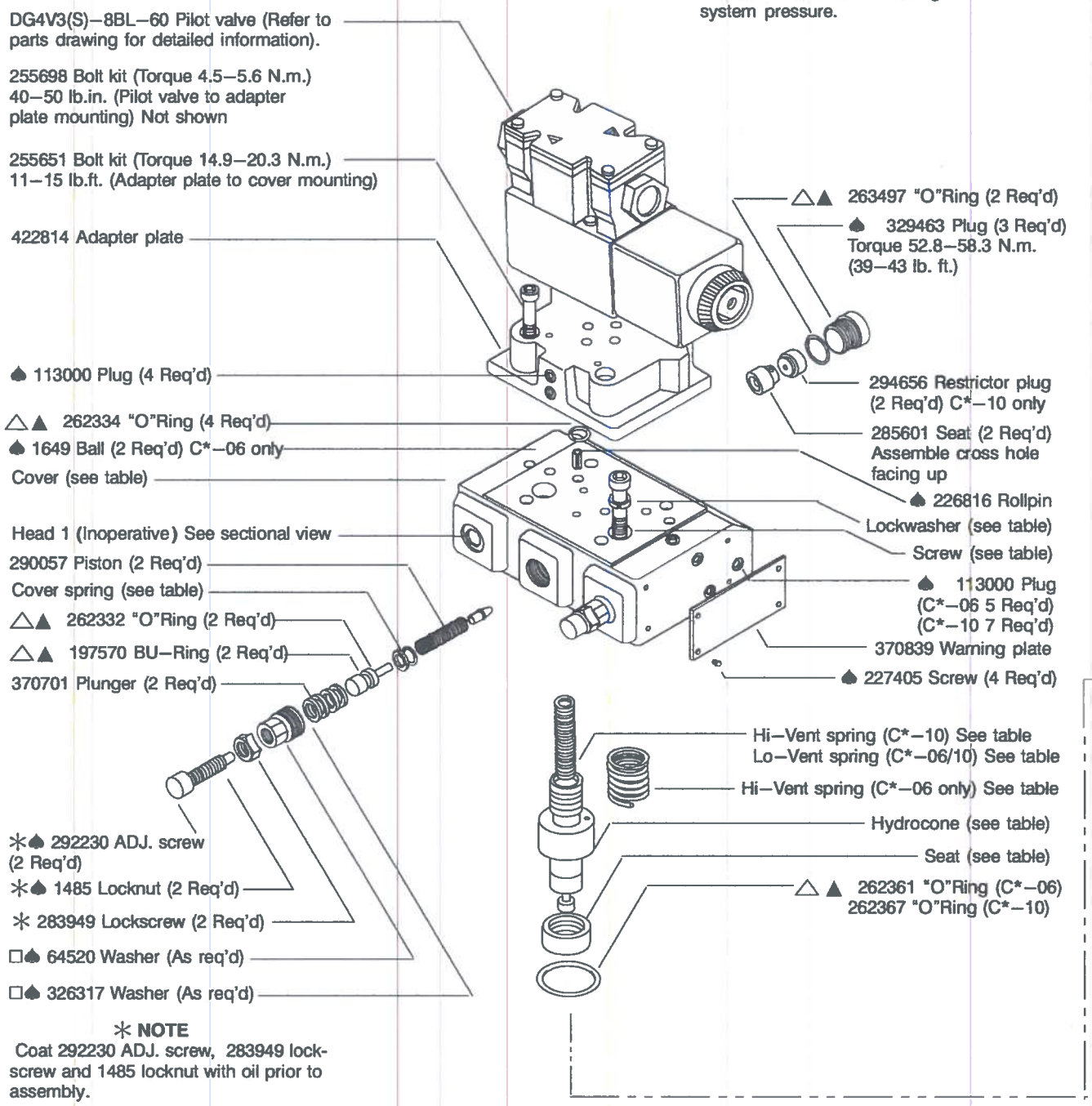
(F3)—C/G/S/T—06/10(*)(V)—DG—8BL**—(V)M—(S*)*****(L)******—40/50**

VICKERS
Released 07—01—91

I—3783—S

NOTE: Lubricate all parts & seals with a thin coat of oil at assembly.

WARNING
Use only a DG4V3(S)–8BL–60 directional valve as a pilot for this relief valve. Use of a different pilot can block relief valve, causing excessive system pressure.


DG4V3(S)–8BL–60 Pilot valve (Refer to parts drawing for detailed information).
255698 Bolt kit (Torque 4.5–5.6 N.m.) 40–50 lb.in. (Pilot valve to adapter plate mounting) Not shown
255651 Bolt kit (Torque 14.9–20.3 N.m.) 11–15 lb.ft. (Adapter plate to cover mounting)
422814 Adapter plate
♠ 113000 Plug (4 Req'd)
△▲ 262334 "O"Ring (4 Req'd)
♠ 1649 Ball (2 Req'd) C*–06 only
Cover (see table)
Head 1 (Inoperative) See sectional view
290057 Piston (2 Req'd)
Cover spring (see table)
△▲ 262332 "O"Ring (2 Req'd)
△▲ 197570 BU–Ring (2 Req'd)
370701 Plunger (2 Req'd)
✳♠ 292230 ADJ. screw (2 Req'd)
✳♠ 1485 Locknut (2 Req'd)
✳ 283949 Lockscrew (2 Req'd)
□♠ 64520 Washer (As req'd)
□♠ 326317 Washer (As req'd)
△▲ 263497 "O"Ring (2 Req'd)
♠ 329463 Plug (3 Req'd) Torque 52.8–58.3 N.m. (39–43 lb. ft.)
294656 Restrictor plug (2 Req'd) C*–10 only
285601 Seat (2 Req'd) Assemble cross hole facing up
♠ 226816 Rollpin
Lockwasher (see table)
Screw (see table)
♠ 113000 Plug (C*–06 5 Req'd) (C*–10 7 Req'd)
370839 Warning plate
♠ 227405 Screw (4 Req'd)
Hi–Vent spring (C*–10) See table
Lo–Vent spring (C*–06/10) See table
Hi–Vent spring (C*–06 only) See table
Hydrocone (see table)
Seat (see table)
△▲ 262361 "O"Ring (C*–06) 262367 "O"Ring (C*–10)

✳ NOTE
Coat 292230 ADJ. screw, 283949 lock-screw and 1485 locknut with oil prior to assembly.

□ NOTE
These parts used at final test to obtain correct pressure range.

Model	Seat	Hydrocone	Lo–Vent spring	Hi–Vent spring	Cover
C*–06	343153	343154	2077	184458	370664
C*–10	283954	283952	291822	291821	370669

NOTE
Use either a Lo–Vent or Hi–Vent spring. Do not use both. (See model code)

NOTE
For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. OFP, OFR, and OFRS series filters are recommended.

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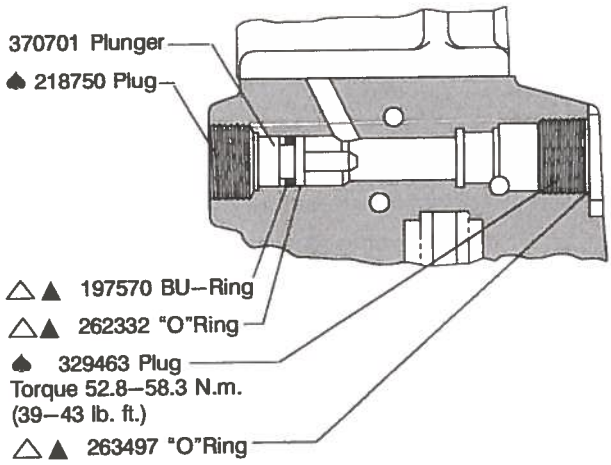
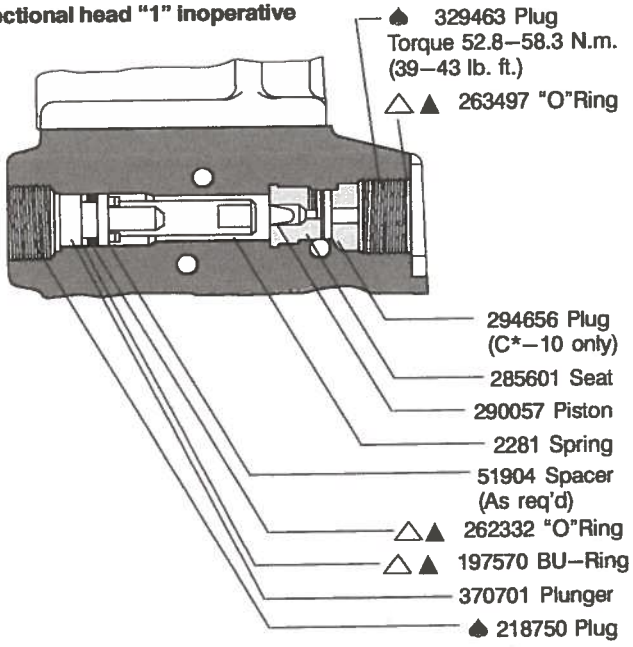
Sectional "E" vent head 2 or 3



Sectional head "1" inoperative

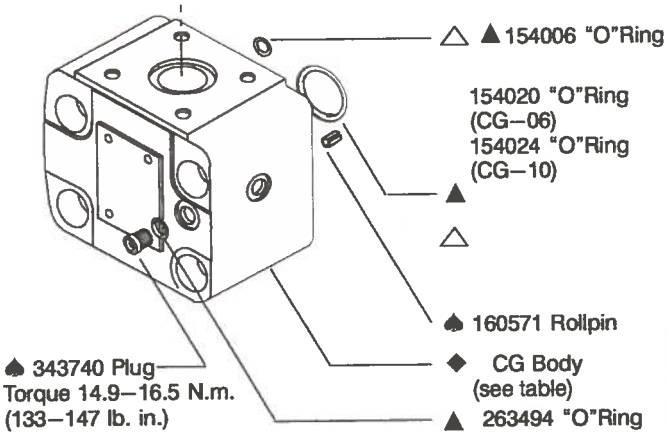


Model	Screw (4 Req'd)	Torque lb. ft.	Torque N.m	Lock washer (4 Req'd)
C*–06	1036	11–15	14.9–20.3	68907
C*–10	1076	35–43	47.5–58.3	68909

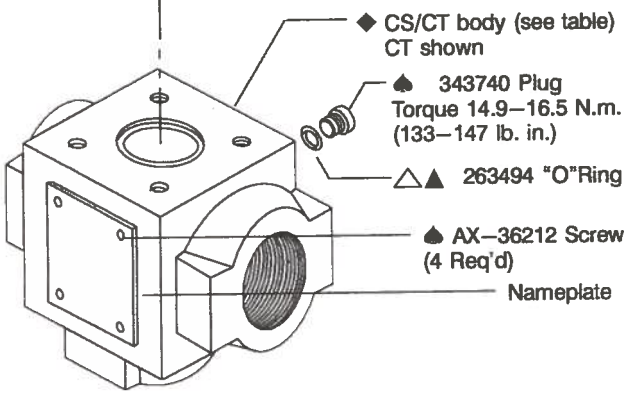
Model	Cover spring	Pressure range psi (bar)
C*–**–B	2280	125–1000 (8.5–70)
C*–**–C	583937	500–2000 (35–140)
C*–**–F	2281	1500–3000 (105–210)

♠ Part	Kit
1485	944064
1649	944067
AX–36212	944053
64520	944068
113000	944055
160571	944069
218750	944070
226816	944071
227405	944074
292230	944072
326317	944073
329463	944041
343740	944038

Parts with ♠ available only in kits of 25.
Reference kit on parts order.

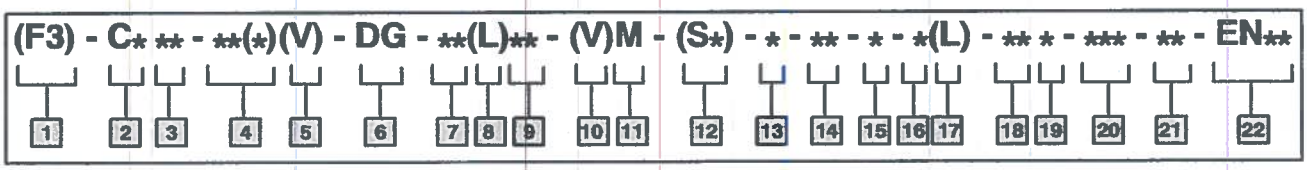


Model	◆ Body –06	◆ Body –10
CG	580456	581703
CS	581701	580430
CT	590348	590300



▲ Included in –06 F3 seal kit 919684
△ Included in –10 F3 seal kit 919685
♠ Available only in kits of 25.
◆ Not available for sale

Model Code



1 Seals for mineral oil & fire resistant fluids

2 Relief valve connections

G — Subplate mounting
S — Straight threads
T — NPTF threads

3 Valve size

06 — 3/4"
10 — 1—1/4"

4 Pressure range

B — 125—1000 psi
C — 500—2000 psi
F — 1500—3000 psi
E — Vent

5 High vent

Blank — Omit for low vent models

6 Directional valve

7 Spool type & spring arrangement

8BL — Spring centered, single sol.

8 Left hand build
Omit for standard models

9 Manual override options (included in pilot valve model code)

Blank — Plain override solenoid ends only
H — Waterproof override solenoid ends only
H2 — Waterproof override both ends of single solenoid
M — Serviceable manual overrides in solenoid ends only
P2 — Plain override both ends of single solenoid
Y — Lockable manual overrides solenoid ends only
Z — No overrides in either end

10 Solenoid energization identity

Blank — Standard arrangement for ANSI B93.9 (energise solenoid A for flow P to A port)
V — Solenoid identification determined by position of solenoid. (Solenoid A at port A end and/or solenoid B at port B end.
(All 4 & 8 spools are always V code)

11 Flag symbol heading electrical options & features

12 Spool position monitoring switch (tank pressure rating 10 bar only)

S1 — Switch, normally open, U coils only
S2 — Switch, normally closed, U coils only
S3 — Switch, wired normally open, P*
S4 — Switch, wired normally closed, P*
S5 — Switch, free leads, FW & FJ only
Omit if not required

13 Coil type

U — ISO 4400
P — Plug in coil
F — Flying lead
SP1 — Single 6,3 series spade to IEC 760
SP2 — Dual 6,3 series spade to IEC 760

14 Electrical connections (F type coil only) omit if not required

T — Wired terminal block
PA — Instaplug male receptacle only
PB — Instaplug male & female receptacle
PA3 — Three pin connector & terminal block
PA5 — Five pin connector & terminal block

15 Housing (F type coils only)

W — 1/2 NPT thread wiring housing
J — 20 mm thread wiring housing

16 Electrical options

1 — ISO with fitted plug, U type coils only
7 — Surge damper, P type coils only
9 — Rectifier (fast type) P type coils only
12 — Rectifier (slow type) P type coils only

17 Solenoid indicator lights (F build only) To be used with T terminal block models.
(Omit if not required)

18 Coil indentification

19 Pilot valve code (tank pressure rating)

2 — 10 bar (145 psi) use with switch models S*
5 — 100 bar (1450 psi) for all other models

20 Pilot valve port orifices

21 Design

40 — DG4V3S—60
Standard pilot valve
50 — DG4V3—60
High performance pilot valve

22 Special modifications (omit if not required)

7 Thru 20 included in pilot valve model code

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

Multi–Pressure Relief Valves

(F3)–C/G/S/T–06/10(*)(V)–DG–8C(L)**–(V)M–(S*)*****(L)******–40/50**

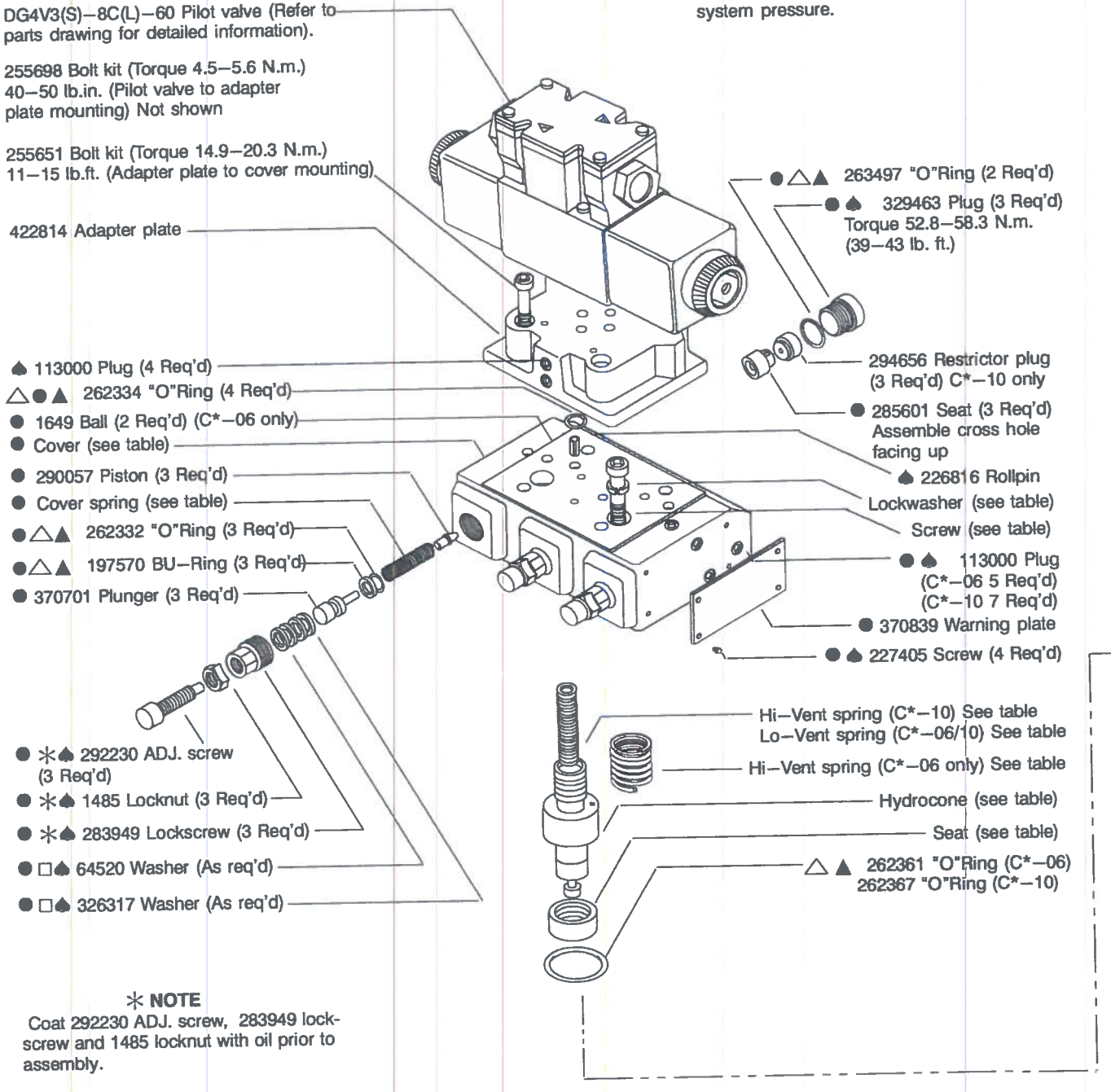
VICKERS

Released 07–01–91

I–3784–S

NOTE: Lubricate all parts & seals with a thin coat of oil at assembly.

WARNING
Use only a DG4V3(S)–8C–60 directional valve as a pilot for this relief valve. Use of a different pilot can block relief valve, causing excessive system pressure.


DG4V3(S)–8C(L)–60 Pilot valve (Refer to parts drawing for detailed information).
255698 Bolt kit (Torque 4.5–5.6 N.m.) 40–50 lb.in. (Pilot valve to adapter plate mounting) Not shown
255651 Bolt kit (Torque 14.9–20.3 N.m.) 11–15 lb.ft. (Adapter plate to cover mounting)
422814 Adapter plate
● △ ▲ 263497 "O"Ring (2 Req'd)
● ♠ 329463 Plug (3 Req'd) Torque 52.8–58.3 N.m. (39–43 lb. ft.)
294656 Restrictor plug (3 Req'd) C*–10 only
● 285601 Seat (3 Req'd) Assemble cross hole facing up
♠ 113000 Plug (4 Req'd)
△ ● ▲ 262334 "O"Ring (4 Req'd)
● 1649 Ball (2 Req'd) (C*–06 only)
● Cover (see table)
● 290057 Piston (3 Req'd)
● Cover spring (see table)
● △ ▲ 262332 "O"Ring (3 Req'd)
● △ ▲ 197570 BU–Ring (3 Req'd)
● 370701 Plunger (3 Req'd)
♠ 226816 Rollpin
Lockwasher (see table)
Screw (see table)
● ♠ 113000 Plug (C*–06 5 Req'd) (C*–10 7 Req'd)
● 370839 Warning plate
● ♠ 227405 Screw (4 Req'd)
Hi–Vent spring (C*–10) See table
Lo–Vent spring (C*–06/10) See table
Hi–Vent spring (C*–06 only) See table
Hydrocone (see table)
Seat (see table)
△ ▲ 262361 "O"Ring (C*–06) 262367 "O"Ring (C*–10)
● ✳ ♠ 292230 ADJ. screw (3 Req'd)
● ✳ ♠ 1485 Locknut (3 Req'd)
● ✳ ♠ 283949 Lockscrew (3 Req'd)
● □ ♠ 64520 Washer (As req'd)
● □ ♠ 326317 Washer (As req'd)

✳ NOTE
Coat 292230 ADJ. screw, 283949 lock-screw and 1485 locknut with oil prior to assembly.

□ NOTE
These parts used at final test to obtain correct pressure range.

Model	Seat	Hydrocone	Lo–Vent spring	Hi–Vent spring	Cover
C*–06	343153	343154	2077	184458	370664
C*–10	283954	283952	291822	291821	370669

NOTE
Use either a Lo–Vent or Hi–Vent spring. Do not use both. (See model code)

NOTE
For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 18/15 or cleaner. OFP, OFR, and OFRS series filters are recommended.

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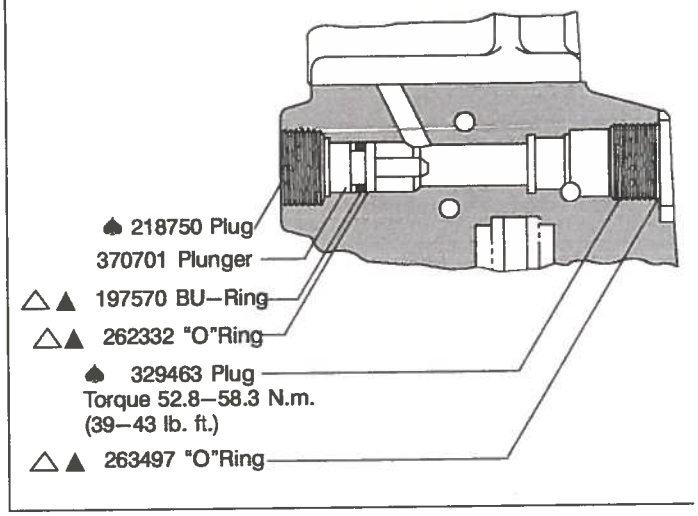
Model	Screw (4 Req'd)	Torque lb. ft.	Torque N.m	Lock washer (4 Req'd)
C*–06	1036	11–15	14.9–20.3	68907
C*–10	1076	35–43	47.5–58.3	68909

Sectional "E" vent head 1, 2, or 3

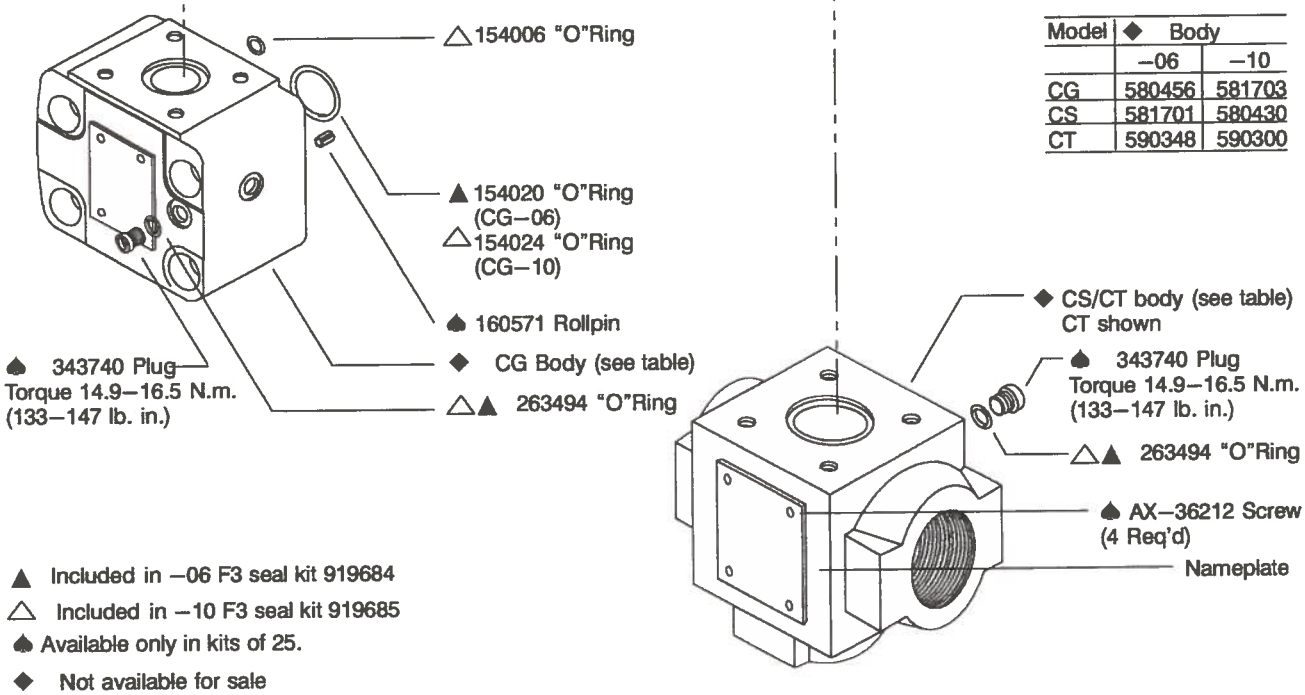


Cover kits for C*–06–*** are available for several spring arrangements	
Spring order in head 1 2 3	● Included in kit (–06 only)
–C B F–	● 942198
–C B C–	● 942202
–F F B–	● 942326

Model	Cover spring	Pressure range psi (bar)
C*–**–B	2280	125–1000 (8.5–70)
C*–**–C	583937	500–2000 (35–140)
C*–**–F	2281	1500–3000 (105–210)

♠ Part	Kit
1485	944064
AX–36212	944053
1649	944067
64520	944068
113000	944055
160571	944069
218750	944070
226816	944071
227405	944074
292230	944072
326317	944073
329463	944041
343740	944038

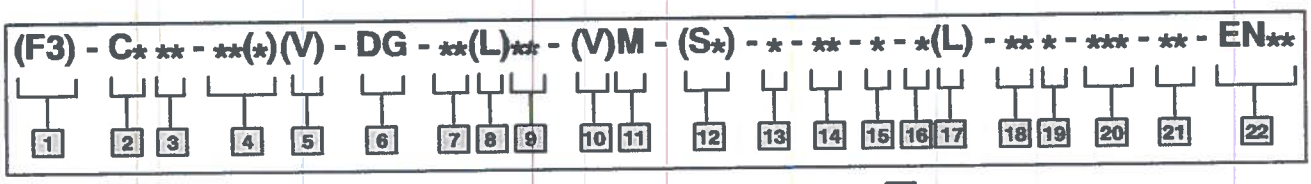
Parts with ♠ available only in kits of 25.
Reference kit on parts order.



Model	◆ Body –06	–10
CG	580456	581703
CS	581701	580430
CT	590348	590300

▲ Included in –06 F3 seal kit 919684
△ Included in –10 F3 seal kit 919685
♠ Available only in kits of 25.
◆ Not available for sale

Model Code



1 Seals for mineral oil & fire resistant fluids

2 Relief valve connections

G – Subplate mounting
S – Straight threads
T – NPTF threads

3 Valve size

06 – 3/4"
10 – 1–1/4"

4 Pressure range

B – 125–1000 psi
C – 500–2000 psi
F – 1500–3000 psi
E – Vent

5 High vent

Blank – Omit for low vent models

6 Directional valve

7 Spool type & spring arrangement

8C – Spring centered, Tri–pressure

8 Left hand build
Omit for standard models

9 Manual override options (included in pilot valve model code)

Blank – Plain override solenoid ends only
H – Waterproof override solenoid ends only
H2 – Waterproof override both ends of single solenoid
M – Serviceable manual overrides in solenoid ends only
P2 – Plain override both ends of single solenoid
Y – Lockable manual overrides solenoid ends only
Z – No overrides in either end

10 Solenoid energization identity

Blank – Standard arrangement for ANSI B93.9 (energise solenoid A for flow P to A port)
V – Solenoid identification determined by position of solenoid. (Solenoid A at port A end and/or solenoid B at port B end.
(All 4 & 8 spools are always V code)

11 Flag symbol heading electrical options & features

12 Spool position monitoring switch (tank pressure rating 10 bar only)

S1 – Switch, normally open, U coils only
S2 – Switch, normally closed, U coils only
S3 – Switch, wired normally open, P*
S4 – Switch, wired normally closed, P*
S5 – Switch, free leads, FW & FJ only
Omit if not required

13 Coil type

U – ISO 4400
P – Plug in coil
F – Flying lead
SP1 – Single 6,3 series spade to IEC 760
SP2 – Dual 6,3 series spade to IEC 760

14 Electrical connections (F type coil only) omit if not required

T – Wired terminal block
PA – Instaplug male receptacle only
PB – Instaplug male & female receptacle
PA3 – Three pin connector & terminal block
PA5 – Five pin connector & terminal block

15 Housing (F type coils only)

W – 1/2 NPT thread wiring housing
J – 20 mm thread wiring housing

16 Electrical options

1 – ISO with fitted plug, U type coils only
7 – Surge damper, P type coils only
9 – Rectifier (fast type) P type coils only
12 – Rectifier (slow type) P type coils only

17 Solenoid indicator lights (F build only) To be used with T terminal block models.
(Omit if not required)

18 Coil indentification

19 Pilot valve code (tank pressure rating)

2 – 10 bar (145 psi) use with switch models S*
5 – 100 bar (1450 psi) for all other models

20 Pilot valve port orifices

21 Design

40 – DG4V3S–60
Standard pilot valve
50 – DG4V3–60
High performance pilot valve

22 Special modifications (omit if not required)

7 Thru 20 included in pilot valve model code

Printed in U.S.A.

Vickers®

Spare Parts

Spare parts information
Ersatzteilinformation
Fiche de pièces détachées
Bollettino parti di ricambio

EATON

ECT5-06/10; 30

Solenoid Controlled Two-Stage Relief Valve

Individual items illustrated in this leaflet are intended to aid dismantling and reassembly of the unit. Certain items may be available only as part of a repair kit.

When ordering replacement parts, please furnish the complete model code and quantity required.

Elektrisch entlastbare Druckbegrenzungs-ventile

Die Abbildung aller Einzelteile soll die Demontage und den Zusammenbau des Gerätes erleichtern. Verschiedene Teile sind nicht einzeln, sondern nur als Bestandteil eines Reparatursatzes erhältlich.

Bei der Bestellung von Ersatzteilen ist die genaue Typenbezeichnung des Gerätes, die Teilnummer und -bezeichnung sowie die gewünschte Stückzahl anzugeben.

Soupape de sûreté à deux étages à commande électrique

Les différentes pièces constitutives des soupapes sont illustrées pour faciliter le démontage et le remontage. Cependant, certaines pièces faisant partie de kits de rechange ne sont pas disponibles séparément.

En commandant des pièces détachées, il est indispensable de préciser le numéro et la désignation des pièces ainsi que la quantité requise, de même que le code de désignation de l'appareil.

Valvola di sicurezza a due stadi a comando elettrico

I vari componenti delle valvole sono illustrati qui per facilitare lo smontaggio ed il rimontaggio. Alcuni componenti non sono disponibili separatamente ma soltanto come parti di un corredo di ricambi.

Nell'ordine di parti di ricambio riportare la designazione del tipo e la quantità richiesta.

Model Codes/Typenschlüssel/Code de désignation/Codici di ordinazione

(F3-)ECT5- ** * (V)(-K)-*** (-*) - (V) M-*** (L) -* 5-3TB**

1 2 3 4 5 6 7 8 9 10 11 12

1	**Special seals** F3 or omit	1	**Sonderdichtungen** F3, oder entfällt	1	**Joints spéciaux** F3 ou omis	1	**Guarnizioni speciali** F3 o omesso
2	**Nominal valve size** 06, 10	2	**Ventilgröße** 06, 10	2	**Taille nominale de la soupape** 06, 10	2	**Dimensione nominale della valvola** 06, 10
3	**Pressure range** B, C, F	3	**Druckbereich** B, C, F	3	**Plage de pression** B, C, F	3	**Campo di pressione** B,C,F
4	**High vent spring** V or omit	4	**Zusatzfeder** V, oder entfällt	4	**Ressort de "vent" renforcé** V ou omis	4	**Molla di sfiato rinforzata** V o omesso
5	**Pressure adjustment method** K or omit	5	**Druckeinstellmöglichkeiten** K, oder entfällt	5	**Mode de tarage de pression** K ou omis	5	**Metodo di taratura della pressione** K o omesso
6	**Pilot valve spool or spring arrangement** OB, OBL, OC, 2A, 2AL, 2C	6	**Kolben-/Feder-Anordnung im Vorsteuerventil** OB, OBL, OC, 2A, 2AL, 2C	6	**Montage tiroir/ressorts du distributeur pilote** OB, OBL, OC, 2A, 2AL, 2C	6	**Cursore valvola pilota o configurazione molla** OB, OBL, OC, 2A, 2AL, 2C
7	**Manual override** H, Z or omit	7	**Manuelle Nothandbetätigung** H, Z, oder entfällt	7	**Commande manuelle** H, Z ou omis	7	**Comando manuale** H, Z o omesso
8	**Solenoid identity method** V or omit	8	**Magneterregung** V, oder entfällt	8	**Identification des solénoïdes** V ou omis	8	**Metodo di identificazione del solenoide** V o omesso
9	**Solenoid connection type** U, FW, FTW, FJ, FTJ	9	**Magnetanschlüsse** U, FW, FTW, FJ, FTJ	9	**Connexion des solénoïdes** U, FW, FTW, FJ, FTJ	9	**Tipo di collegamento solenoide** U, FW, FTW, FJ, FTJ
10	**Indicator lights** L or omit	10	**Anzeigelampen** L, oder entfällt	10	**Témoins lumineux** L ou omis	10	**Lampade spia** L o omesso
11	**Coil rating** A, B, C, D, G, H	11	**Magnetkennzeichnung** A, B, C, D, G, H	11	**Tension des solénoïdes** A, B, C, D, G, H	11	**Tensione solenoide** A, B, C, D, G, H
12	**Design number** 30	12	**Seriennummer** 30	12	**Numéro de dessin** 30	12	**Numero di disegno** 30

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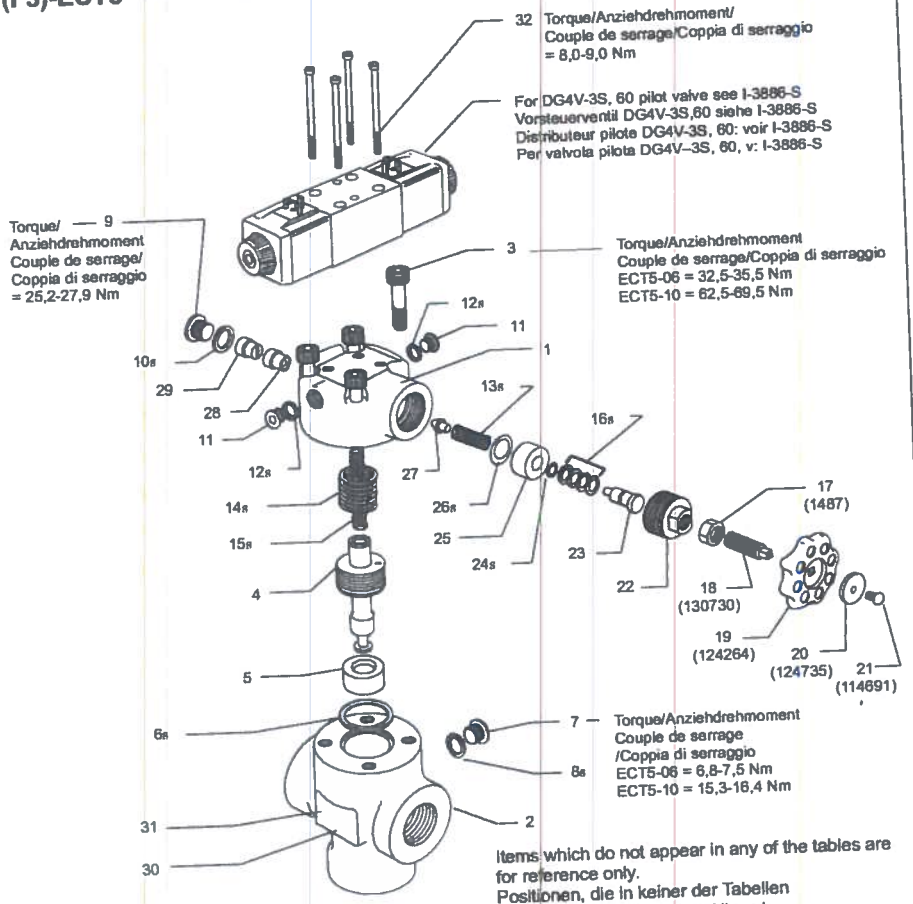
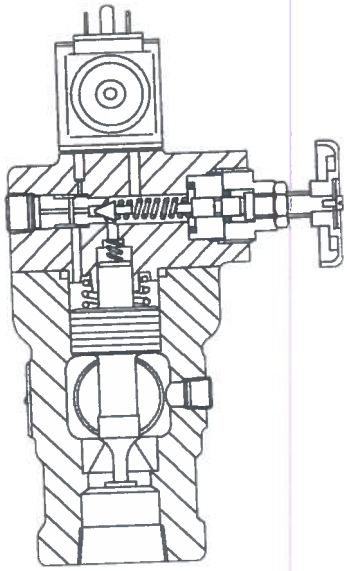
(F3)-ECT5-****-****-30TB



Items which do not appear in any of the tables are for reference only.
Positionen, die in keiner der Tabellen erscheinen, dienen nur als Hinweis.
Les repères qui ne figurent dans aucun tableau ne sont donnés qu'à titre indicatif.
Le voci che non compaiono in nessuna tavola sono solo per riferimento.

(F3)-ECT5



s See tables/Siehe Tabellen/Voir les tableaux/V. tabelle

Model code Typenbez. Désignation Codice modello	Item no./Pos./Rep./Pos. 13	14	15	16
ECT5-06B ECT5-06BV	2280 2280	– 28423	2077 –	130735 3 off/Stck./ unités/pezzi
ECT5-06C ECT5-06CV	2282 2282	– 28423	2077 –	130735 2 off/Stck./ unités/pezzi
ECT5-06F ECT5-06FV	2281 2281	– 28423	2077 –	130735 5 off/Stck./ unités/pezzi
ECT5-10B ECT5-10BV	2280 2280	– 28422	2090 28421	130735 3 off/Stck./ unités/pezzi
ECT5-10C ECT5-10CV	2282 2282	– 28422	2090 28421	130735 2 off/Stck./ unités/pezzi
ECT5-10F ECT5-10FV	2281 2281	– 28422	2090 28421	130735 5 off/Stck./ unités/pezzi

Seal kits
Dichtungssätze
Pochettes de joints
Corredo di guarnizioni
6, 8, 10, 12, 24, 26

ECT5-06	Standard	708239
F3-ECT5-06	F3	466917
ECT5-10	Standard	708242
F3-ECT5-10	F3	466916

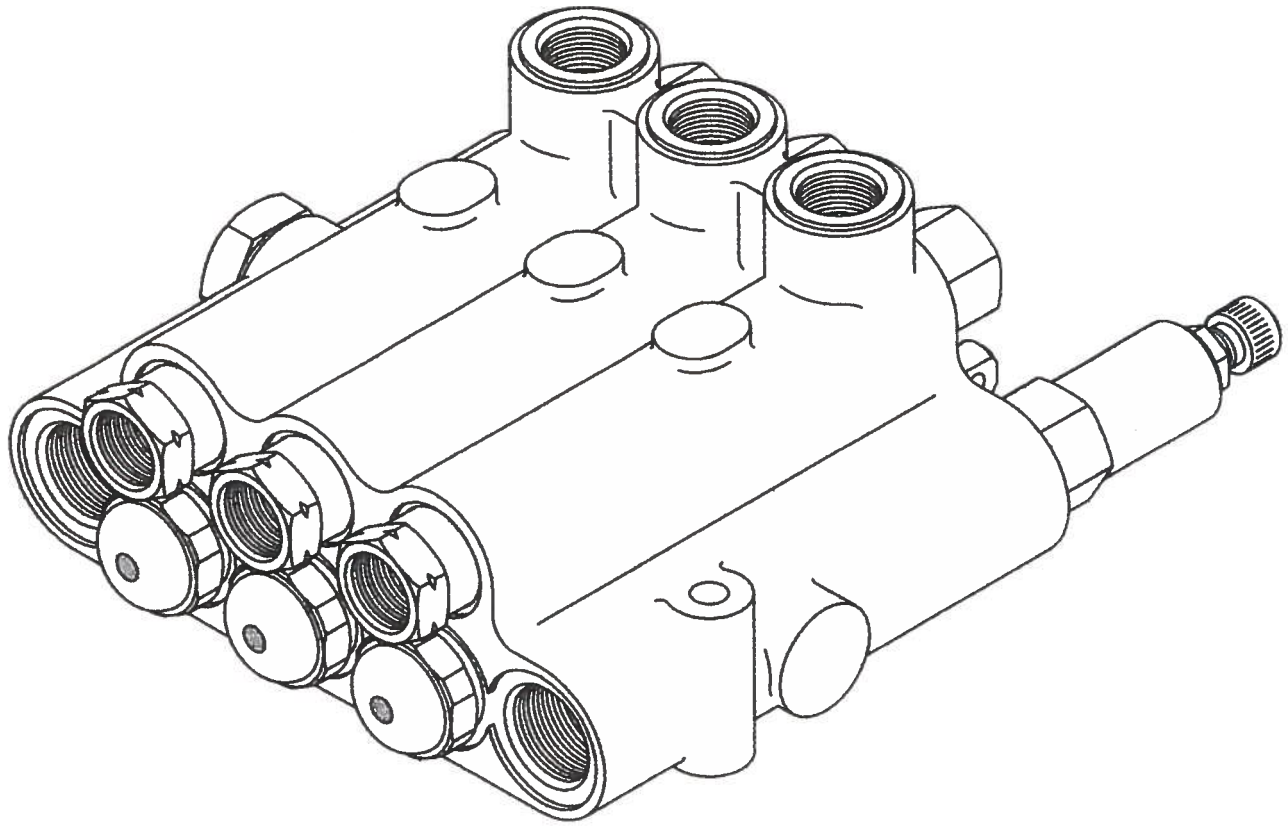
The right to modification for technical improvement is reserved.
Durch technische Weiterentwicklung bedingte Änderungen vorbehalten.
Tous droits de modification pour amélioration technique réservés.
Si riservano i diritti di modifiche tecniche.

NO. 6-522

Eaton
Hydraulics
Division

Parts Information

Model 31520 - 31530 Directional Control Valve



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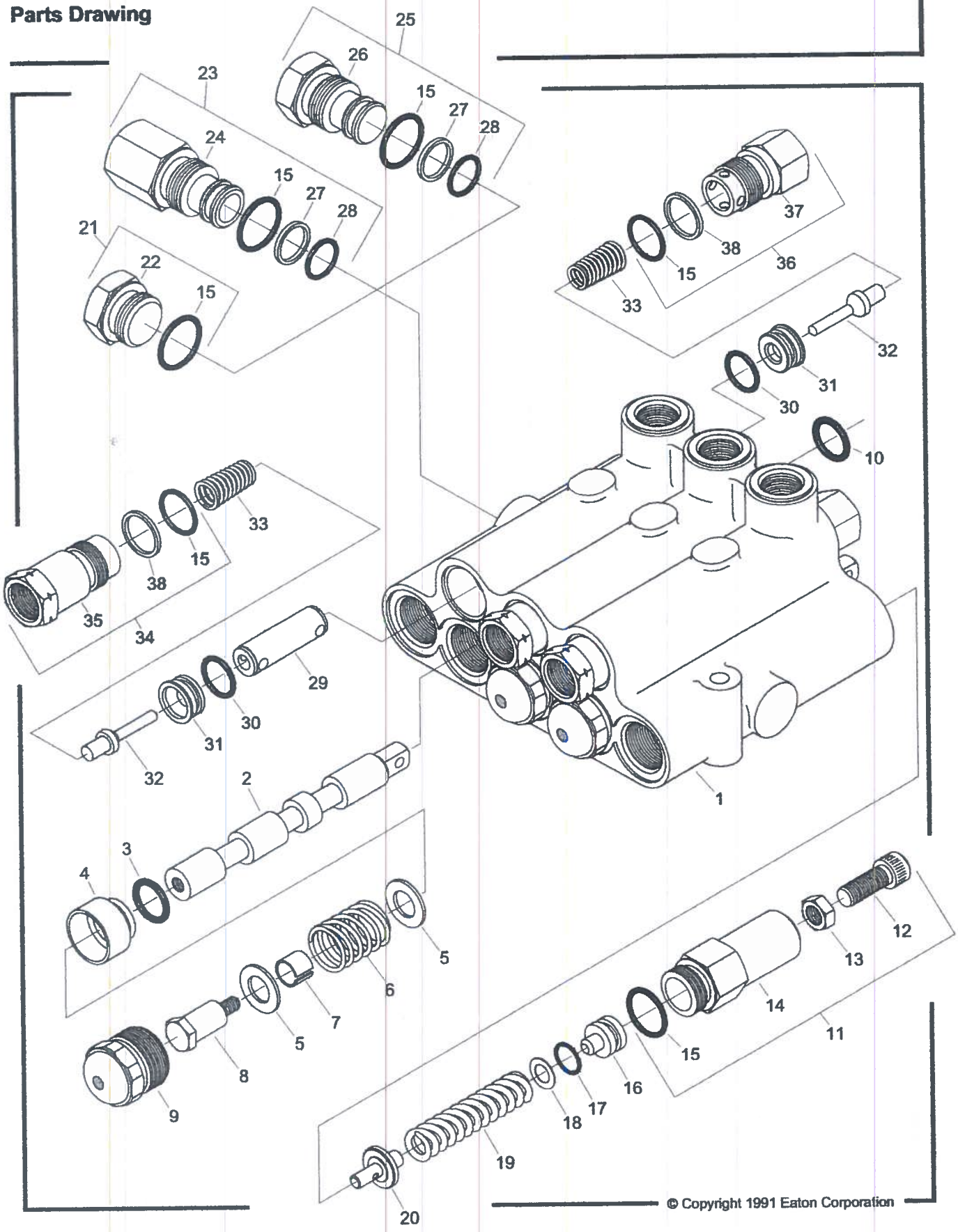
Parts Drawing



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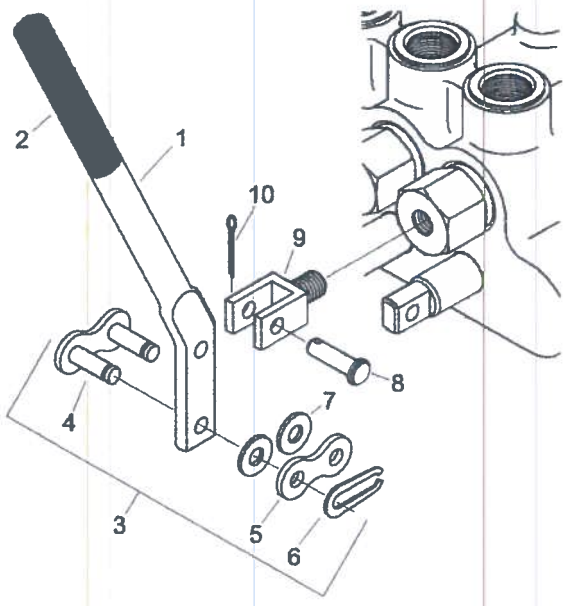
Ref. No.	Description	Part Number	Quantity
1	Body	NSS	1
2	Spool	NSS	A/R
~ 3	O-ring (Spring End)	16003 - 612	1/Spool
4	Bushing	31500 - 358	1/Spool
5	Washer	16048 - 1	2/Spool
6	Spring, Spool	33002 - 24	1/Spool
7	Spool Spacer	31901 - 6	1/Spool
8	Spool Screw	31503 - 63	1/Spool
9	Spool Cap Assembly	31500 - 372	1/Spool
	Breather Plug	16066 - 403	1/Spool
~ 10	O-ring (Handle End)	16004 - 663	1/Spool
11	Relief Valve Plug Assembly	31500 - 549	1
12	Cap Screw	16148 - 610	1
13	Jam Nut	16024 - 6	1
14	Relief Valve Cap	31500 - 548	1
~ 15	O-ring	16003 - 14	A/R
16	Spring Guide	30501 - 418	1
~ 17	O-ring	16003 - 9	1
† 18	Shim Washer	16048 - 69	A/R
19	Relief Valve Spring	*	1
20	Poppet	30501 - 417	1
21	Standard Plug Assembly	16169 - 1140	1
22	Standard Plug	NSS	1
23	Pressure Beyond Plug Assy. (7/8-14 SAE)	30501 - 74	1
24	Pressure Beyond Plug (7/8-14 SAE)	NSS	1
25	Closed Center Plug Assembly	30501 - 96	1
26	Closed Center Plug	NSS	1
27	Back-Up Ring	16101 - 204	1
28	O-ring	16015 - 4	1
29	Check Plunger	15440 - 17	1/Spool
~ 30	O-ring	16003 - 11	2/Spool
31	Seat	30000 - 36	2/Spool
~ 32	Poppet Assembly	15440 - 317	2/Spool
33	Check Spring	31500 - 551	2/Spool
34	Seat Retaining Plug Assembly with Work Port	31500 - 426	1/Spool
35	Seat Retaining Plug with Work Port	NSS	1/Spool
36	Seat Retaining Plug Assembly	31500 - 546	1/Spool
37	Seat Retaining Plug	NSS	1/Spool
~ 38	Back-Up Ring	16011 - 214	2/Spool
	Seal Repair Kits		
	One Spool Valve with Relief	31521 - 908	
	Two Spool Valve with Relief	31522 - 913	
	Three Spool Valve with Relief	31523 - 917	
	One Spool Valve without Relief	31530 - 919	
	Two Spool Valve without Relief	31532 - 902	
	Three Spool Valve without Relief	31530 - 920	

NSS Not sold separately
A/R As required
† Install the same shim thickness as removed. At least one shim is required.
* Refer to the table on the back page for specific part numbers.
~ Parts included in Seal Repair Kits.

Handle Parts



Ref. No.	Description	Part Number	Quantity
	Handle Kit	31500-908	1/Spool
1	Handle	31500-547	1
2	Handle Cover	16126-85	1
3	Handle Link Assy.	30501-331	1
4	Connecting Link	30501-332	1
5	Link Plate	30501-333	1
6	Spring Clip	30501-334	1
7	Washers	32016-7	2
8	Clevis Pin	31900-711	1
9	Lever Support	31900-710	1
10	Cotter Pin	16027-203	1

Ref. No. 19 Relief Valve Spring

Pressure Adjustment Range	Part Number
1000 - 1500 PSI	17060-37
1450 - 2000 PSI	17060-38
1950 - 2300 PSI (Standard)	17060-39
2250 - 2500 PSI	17060-40

Information on orifice plates is contained in the Orifice Plate Catalog Sheet, Form 11-502.

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FORM NO. 6-522
July 1991

Printed in U.S.A.

Service Data

Vickers®

Relief Valves

EATON

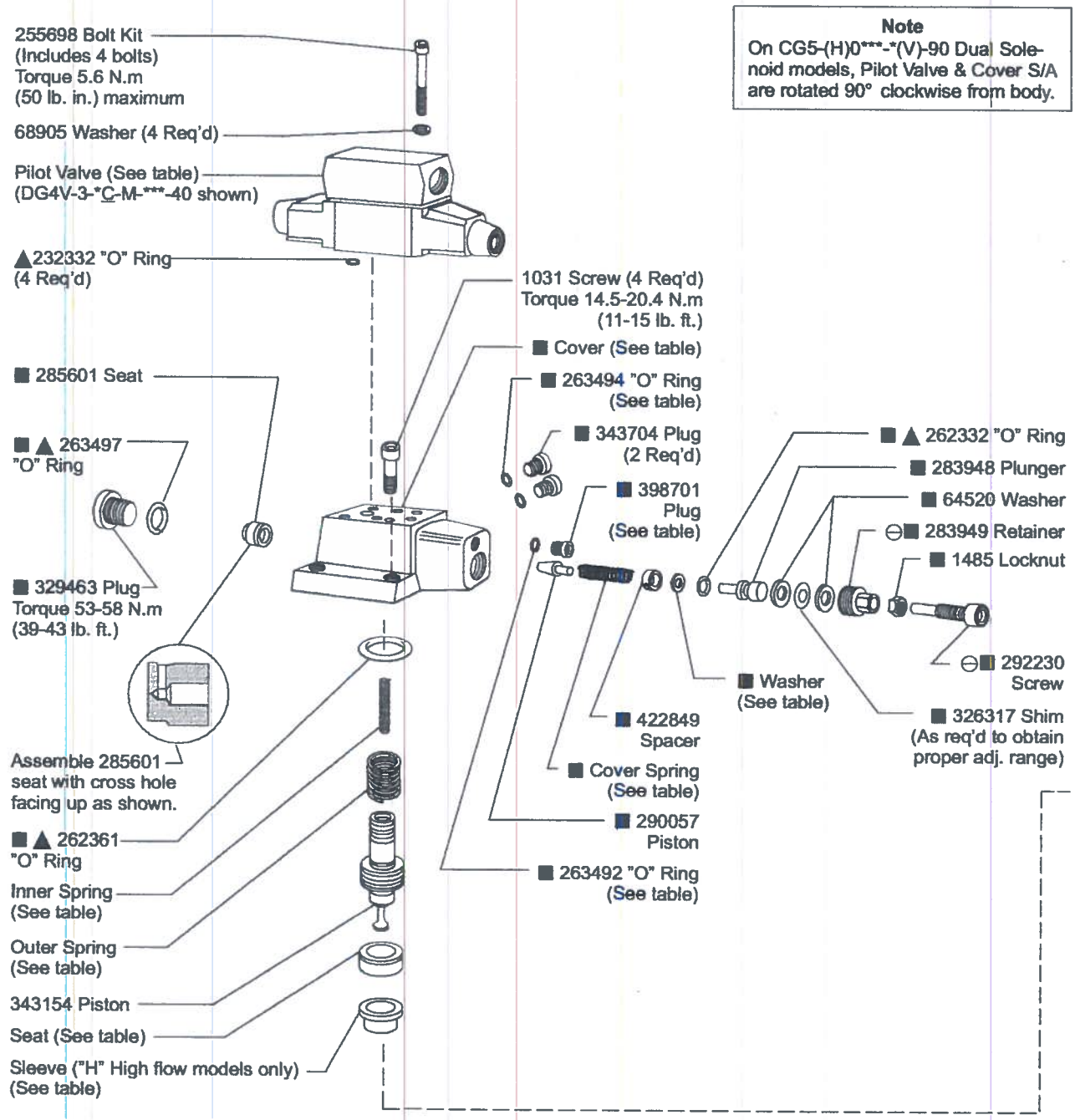
Solenoid Controlled Relief Valves

(F3)-CG5-(H)06(L)(P)-*(V)-(M)-****-90**
(F3)-CS5-(H)03/06(L)(P)-*(V)-M-****-90**
(F3)-CT5-06(L)(P)-*-M-****-90**

VICKERS

Revised 9/01/87

I-3426-S



Note
On CG5-(H)0***-*(V)-90 Dual Solenoid models, Pilot Valve & Cover S/A are rotated 90° clockwise from body.

Model	Seat	Sleeve
C*5-03/06	343153	———
C*5-H06	589473	589472

Model	■ Washer	Inner Spring	Outer Spring	■ Cover Spring
C*5-0***-B-90	———	2077	———	2280
C*5-H0***-BV-90		———	184458	
C*5-0***-C-90	233110	2077	———	583937
C*5-H0***-CV-90		———	184458	
C*5-0***-F-90	———	2077	———	2281
C*5-H0***-FV-90		———	184458	

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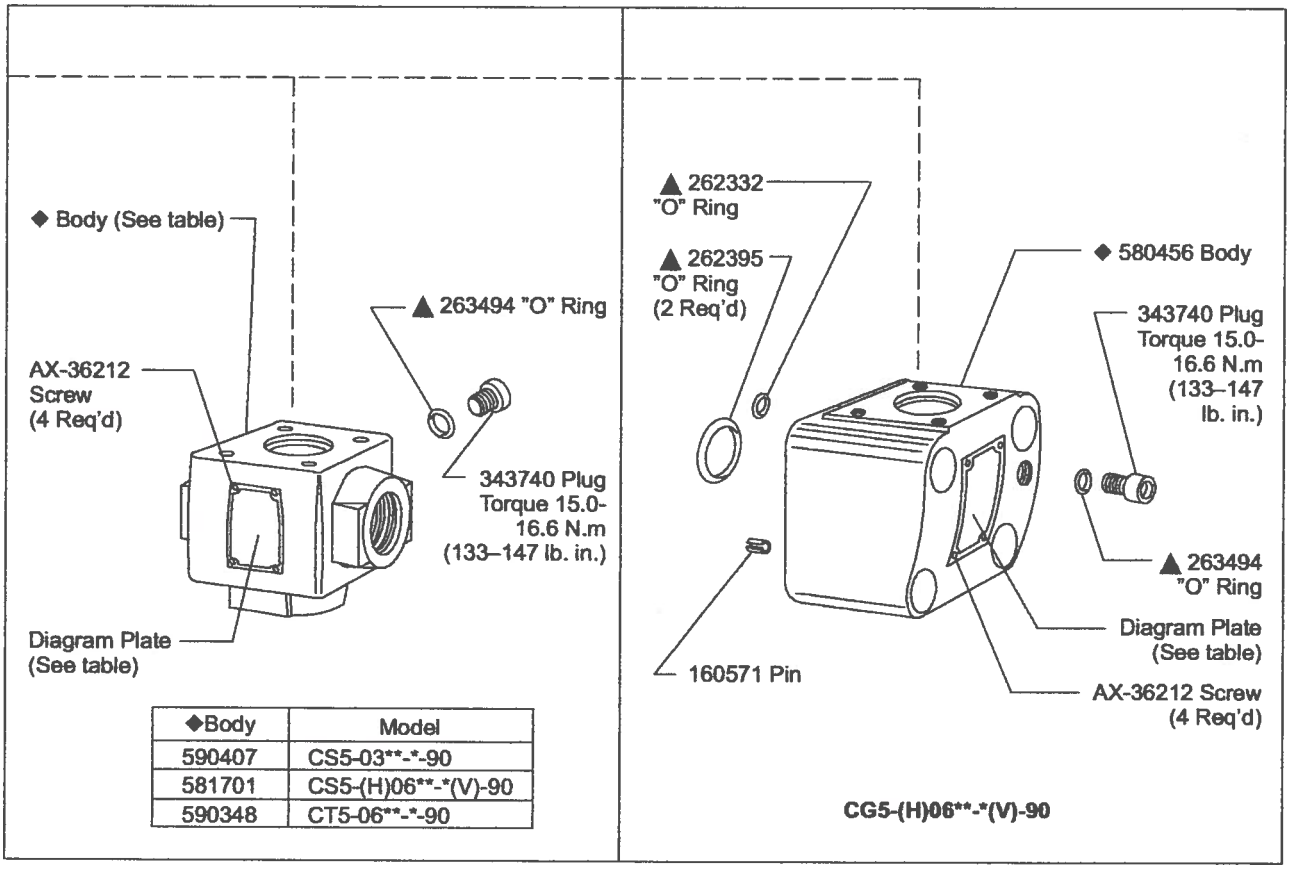
Model	Diagram Plate	Pilot Valve	Pilot Valve Parts Drwg.
C*5-(H)0*0A(P)-*(V)-M-***-90	422864	DG4V-3-0BL-M***-40	I-3862-S
C*5-(H)0*1A(P)-*(V)-M-***-90	422865	DG4V-3-2AL-M***-40	I-3861-S
C*5-(H)0*2A(P)-*(V)-M-***-90	423814	DG4V-3-2BL-M***-40	I-3862-S
C*5-(H)0*0C-*(V)-M-***-90	422862	DG4V-3-0C-M***-40	I-3863-S
C*5-(H)0*2C-*(V)-M-***-90	422863	DG4V-3-2C-M***-40	I-3863-S
C*5-(H)0*0F(P)-*(V)-M-***-90	477211	DG4V-3-0FL-M***-40	I-3864-S

Model	■ Cover S/A
C*5-(H)0*0A/F-B(V)-90	942432
C*5-(H)0*0A/F-C(V)-90	942433
C*5-(H)0*0A/F-F(V)-90	942434
C*5-(H)0*1A-B(V)-90	942435
C*5-(H)0*2A-B(V)-90	
C*5-(H)0**C-B(V)-90	
C*5-(H)0*1A-C(V)-90	942436
C*5-(H)0*2A-C(V)-90	
C*5-(H)0**C-C(V)-90	
C*5-(H)0*1A-F(V)-90	942437
C*5-(H)0*2A-F(V)-90	
C*5-(H)0**C-F(V)-90	

Model	■ Cover S/A	■ Plug/"O" Ring (2 Req'd)	■ Plug/"O" Ring
C*5-(H)0*0A-90	422828	———	———
C*5-(H)0*1A-90	424203	343740/▲263494	398071/▲263492
C*5-(H)0*2A-90			
C*5-(H)0**C-90			

Note
Parts prefixed with a symbol available only in kits.

■ Included in Cover S/A
▲ Included in F3 Seal Kit 920344 (includes pilot valve seasl)
⊖Lubricate with oil before assembly
◆ Not available for sale


◆ Body (See table)
▲ 263494 "O" Ring
AX-36212 Screw (4 Req'd)
343740 Plug Torque 15.0-16.6 N.m (133–147 lb. in.)
Diagram Plate (See table)
▲ 262332 "O" Ring
▲ 262395 "O" Ring (2 Req'd)
◆ 580456 Body
343740 Plug Torque 15.0-16.6 N.m (133–147 lb. in.)
▲ 263494 "O" Ring
Diagram Plate (See table)
160571 Pin
AX-36212 Screw (4 Req'd)

◆Body	Model
590407	CS5-03**-*-90
581701	CS5-(H)06**-*(V)-90
590348	CT5-06**-*-90

CG5-(H)06-*(V)-90**

Model Code

(F3) - C * 5 - (H) * * * * (L) (P) - * (V) - M - * * * * - 90

1 2 3 4 5 6 7 8 9 10 11 12 13 14

1 Seal Material

F3 - Seals for mineral oil and fire resistant fluids

2 Model Series

C - Relief valve
G - Subplate mounting,
S - Straight threads
T - NPTF threads

3 Solenoid Controlled

4 High Flow

CG5 or CS5 models only
(Omit if not required)

5 Valve Size

03 - 3/8 inch
06 - 3/4 inch

6 Pilot Valve Spool Type

7 Pilot Valve Function

A - Spring offset (single solenoid)
B - Spring centered (solenoid 'A' removed)
C - Spring centered (dual solenoid)
F - Spring offset (single solenoid) engergize to vent

8 Left Hand Built Single Solenoid Pilot Valve

Omit - If not required

9 Manual Operator for Single Solenoid Pilot Valve

Omit - If not required

10 Pressure Range

B - 125-1000 PSI
C - 500-2000 PSI
F - 1500-3000 PSI

11 High Vent

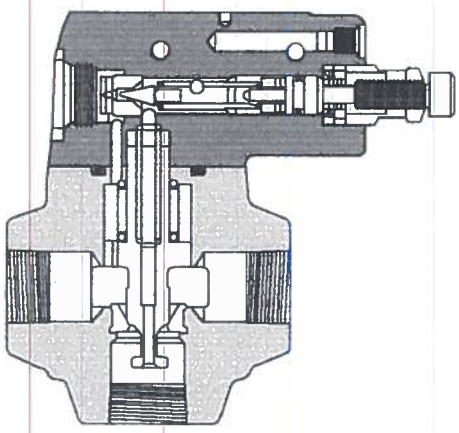
Omit - If not required

12 Flag Symbol Heading for Pilot Valve Electrical Features

13 Pilot Valve Electrical Features

(Refer to Drawing I-3866-S & pilot valve parts drawing)

14 Design



Relief Valve Sectional View without Pilot Valve

For satisfactory service life of these components in industrial applications, use full flow filtration to provide fluid which meets ISO cleanliness code 20/18/15 or cleaner. Selections from Eaton OFP, OFR, and OFRS series are recommended.

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